AD-A141 881 INSPECTION DATA FOR SPARK IGNITION ENGINES FROM AIR FORCE NONTACTICAL VEH..(U) SOUTHWEST RESEARCH INST SAN ANTONIO TX ARMY FUELS AND LUBRICA.. W E BUTLER ET AL. 1/2

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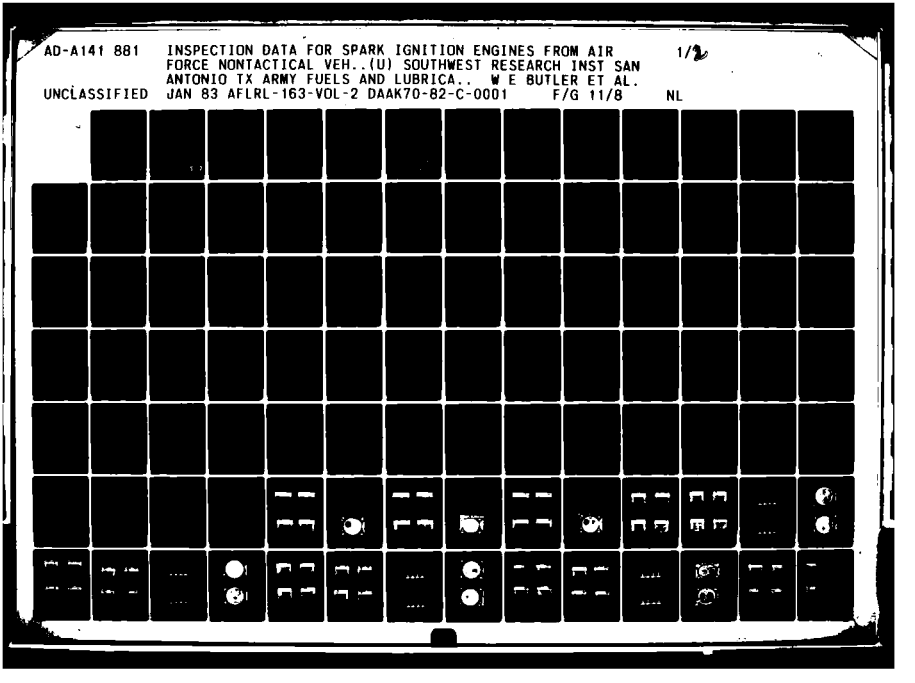

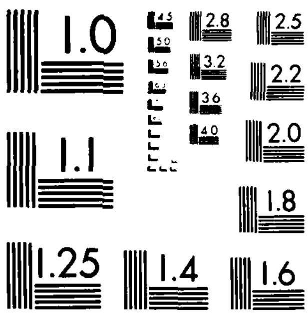

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INSPECTION DATA FOR SPARK-IGNITION ENGINES FROM AIR FORCE NONTACTICAL VEHICLES (MEEP Project H79-C, Synthetic Oils)

INTERIM REPORT
AFLRL No. 163

VOLUME II — APPENDICES

By

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19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Synthetic lubricants
Multiviscosity
Additives
Alkalinity
Particulates

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Many DOD vehicles are operated under short-trip, "stop and go" conditions. Since this type of operation imposes severe requirements on the engine oil and because poor performances and failure in the engine oil increase operation and maintenance costs, the decision was made to test synthetic lubricants as a possible solution to the problem. Today's energy shortage, rising labor and material cost, and smaller budgets require exploration of

20. ABSTRACT (Cont'd)

potential methods of cost reductions in operation of government vehicles. This MEEP project was requested by the Triservices through the Joint Deputies for Laboratory Committee (JDLC). Of approximately 450 general-purpose vehicles selected by 11 Air Force installations for this program, 29 of the vehicles were chosen for engine inspection at USAFLRL, San Antonio, TX. These 29 engines were disassembled by AFLRL personnel and inspected in accordance with CRC rating methods. Wear measurements were made of selected parts, and photographs were taken of representative parts from each engine. For various reasons the three engines from Sondrestrom Air Force Base were eliminated from the test at this point and are not included in this report. The number of engines was thus reduced to 26. A comparison was also made between the lubricants used in the test by utilizing the oil analyses data provided by the Technical Service Center, Joint Oil Analysis Program Laboratory in Pensacola, FL and copies of the individual maintenance records provided by each installation. Based solely on the results of the engine tear-down inspections and in consideration of the data developed from oil analyses and maintenance records, synthetic lubricants can be successfully used in spark ignition engines. Statistical studies revealed no significant differences could be determined which would clearly indicate if the use of any one test oil would be more advantageous than the use of any of the other test lubricants. Final conclusions, of course, reside with the Warner Robins Air Logistics Center where coordination of the compilation of a report covering all aspects of the program will be made.

FOREWORD/ACKNOWLEDGMENTS

This report was prepared by the U.S. Army Fuels and Lubricants Research Laboratory (AFLRL) located at Southwest Research Institute, San Antonio, TX, under Contract No. DAAK70-82-C-0001. It presents the work done by AFLRL personnel for the period September 1981 through October 1982. This work was performed as part of MEEP Project H-79-1C, Synthetic Oils initiated by the U.S. Air Force at Warner Robins Air Logistics Center (AFLC), Robins Air Force Base, GA in response to a request by the Triservices through the Joint Deputies for Laboratory Committee (JDLC). The Project monitor for the Air Force was Mr. C.H. Coffey, Warner Robins Air Force Base. The Project Monitor and Contracting Officer's Representative for the Army was Mr. F.W. Schaekel, Belvoir Research and Development Center, STRBE-VF, Ft. Belvoir, VA.

The authors acknowledge with appreciation the cooperation and immediate response by MEEP and Air Force maintenance personnel, without which this report could not have been successfully concluded. Also appreciated was the help and support of Mr. Sidney J. Lestz, USAFLRL.

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APPENDIX A

ENGINE INSPECTION DATA
- RATINGS -

TABLE A-1. ENGINE INSPECTION DATA-RATINGS

Type Oil USAF Academy CO Ford, 6 cyl, 200 CID	AFLRL No. (Vehicle No.) 28(79B5659) Green	 26(79B5660) Yellow	 27(79B5668) Blue(C)
Sludge Ratings (Merit)*			
Rocker Arm Cover	9.63	9.68	9.62
Oil Pan	9.40	9.53	9.40
Valve Deck	9.75	9.75	9.75
Underside of Block	**	**	**
Timing Gear Cover	#	#	#
Average Ratings	9.6	9.7	9.6
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	6.22	6.35	8.53
Anti-Thrust	6.25	6.32	8.47
Rocker Arm Cover	6.00	6.88	6.50
Cylinder Walls			
Thrust	8.83	9.08	9.65
Anti-Thrust	9.00	8.93	9.65
Front	5.50	5.83	9.10
Back	5.47	5.67	8.85
Oil Pan	6.95	7.23	6.90
Lifter Bodies	9.01	9.13	9.83
Lifter Plungers	10.00	10.00	10.00
Average Ratings	7.3	7.5	8.7
Other Ratings			
Oil Ring, % Clogging	1.00	1.00	1.00
Oil Screen, % Clogging	#	#	#
Intake Valve Deposits*	6.68	6.02	6.55
Ring Sticking	Free	Free	Free

* 10 = Clean.

\# Part not with the engine when uncrated.

TABLE A-2. ENGINE INSPECTION DATA-RATINGS

Type Oil George AFB, CA Dodge, V-8, 318 CID	AFLRL No. (Vehicle No.) 40(79B2533) Green	 39(79B2534) Yellow	 38(79B2539) Blue(C)
Sludge Ratings (Merit)*			
Left Rocker Arm Cover	**	**	**
Right Rocker Arm Cover	**	**	**
Oil Pan	**	**	**
Underside of Block	**	**	**
Left Valve Deck	9.75	9.75	9.75
Right Valve Deck	9.75	9.75	9.75
Pushrod Chamber	9.75	9.75	9.75
Timing Gear Cover	**	**	**
Average Ratings	9.75	9.75	9.75
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	5.99	5.89	6.125
Anti-Thrust	5.94	6.98	6.438
Left Rocker Arm Cover	**	**	**
Right Rocker Arm Cover	**	**	**
Cylinder Walls			
Thrust	7.66	8.25	8.56
Anti-Thrust	7.69	8.63	8.56
Front	5.06	6.75	5.30
Back	4.81	7.25	5.35
Oil Pan	**	**	**
Lifter Bodies	8.89	8.59	8.75
Lifter Plungers	10.00	10.00	10.00
Average Ratings	7.0	7.8	7.4
Other Ratings			
Oil Ring, % Clogging	1.00	1.00	1.00
Oil Screen, % Clogging	**	**	**
Push Rods, % Clogging	#	#	#
Intake Valve Deposits	6.63	8.76	8.99
Ring Sticking	Free	Free	Free

* 10 = Clean
** Parts not with the engine when uncrated
\# Solid Push Rods

TABLE A-3. ENGINE INSPECTION DATA-RATINGS

Type Oil GRAND FORKS AFB, ND. Chevrolet, V-8, 350 CID	AFLRL No. (Vehicle No.) 29(79B1734) Yellow	 32(79B1735) Blue(B)
Sludge Ratings (Merit)*		
Left Rocker Arm Cover	9.49	9.40
Right Rocker Arm Cover	9.51	9.48
Oil Pan	9.51	9.33
Underside of Intake Manifold	9.69	@
Left Valve Deck	9.50	9.50
Right Valve Deck	9.50	9.50
Push Rod Chamber	9.50	9.50
Timing Gear Cover	10.00**	10.00
Average Ratings	9.6	9.5
Varnish Ratings (Merit)*		
Piston Skirts		
Thrust	7.55	6.26+
Anti-Thrust	7.10	6.23+
Left Rocker Arm Cover	6.66	6.30
Right Rocker Arm Cover	6.95	7.80
Cylinder Walls		
Thrust	9.19	9.125
Anti-Thrust	8.75	9.063
Front	8.21	7.363
Back	8.61	7.850
Oil Pan	7.05#	6.78
Lifter Bodies	8.69##	8.79++
Lifter Plungers	9.85	10.00
Average Ratings	8.1	7.8
Other Ratings		
Oil Ring, % Clogging	1.00	1.00
Oil Screen, % Clogging	1.00	<1.00
Push Rods, % Clogging	0.00	0.00
Intake Valve Deposits	7.19	7.06
Ring Sticking	Free	Free

* 10 = Clean

** The timing gear cover was metal; usually plastic; cover looked too clean

\# At some time the pan had developed a leak and the hole was brazed

Lifter body No. 1 - Body scuffed where it rides in block;
No. 5 - Cracked
No. 6 - Chipped & worn
No. 7 - Chipped
No. 8 - Cracked, worn & scuffed
No. 10 - Worn & scuffed
No. 11 - Chipped, scuffed & worn
No. 12 - Chipped & scuffed
No. 13 - Light wear & scuffing
No. 14 - Cracked, scuffed & worn
No. 15 - Light scuffing
No. 16 - Light scuffing

@ Not with engine when engine uncrated.

\+ Piston No. 1 - 75% scuffing thrust side
No. 3 - 20% scuffing thrust side
No. 4 - 50% light scuffing thrust side: 15% scuffing anti-thrust side
No. 5 - 15% light scuffing thrust side
No. 6 - 15% scuffing and light scratches anti-thrust side
No. 7 - 15% scuffing thrust side
No. 8 - 100% scuffing thrust side; 70% light scuffing anti-thrust side; this was not a piston originally with this engine

++ The lifter bodies in this engine were different than the lifter bodies in the other 350 CID engines.

TABLE A-4. ENGINE INSPECTION DATA-RATINGS

Oil Type Hancock Field, NY (42) Plymouth, 6 cyl, 225 CID (43) Ford, 6 cyl, 300 CID	AFLRL No. (Vehicle No.) 42(78B5038) Green	 43(78B5646) Yellow
Sludge Ratings (Merit)*		
Rocker Arm Cover	**	**
Side Cover	#	#
Oil Pan	**	**
Valve Deck	**	**
Push Rod Chamber	#	#
Timing Gear Cover	**	**
Varnish Ratings (Merit)*		
Piston Skirts		
Thrust	5.57	9.95
Anti-Thrust	5.43	9.95
Rocker Arm Cover	**	**
Cylinder Walls		
Thrust	7.23	9.95
Anti-Thrust	8.02	9.95
Front	5.47	9.95
Back	3.17	9.95
Oil Pan	**	**
Lifter Bodies	7.13	9.95
Lifter Plungers	Solid Lifters	9.95
Average Ratings	6.0	9.95
Other Ratings		
Oil Ring, % Clogging	1.00	<1.00
Oil Screen, % Clogging	**	**
Push Rod, % Clogging	**	**
Intake Valve Deposits	**	**
Ring Sticking	##	Free

* 10 = Clean
** Not with engine when uncrated
# Does not apply to this engine
No. 1 and 2 rings sluggish on No. 1 piston; oil rings stuck on pistons No. 1 through No. 6

TABLE A-5. ENGINE INSPECTION DATA-RATINGS

Type Oil Lackland AFB, TX Ford, 6 cyl, 300 CID	AFLRL No. (Vehicle No.) 25(79B2271) Green	 23(79B2270) Yellow	 24(79B2272) Blue(A)
Sludge Ratings (Merit)*			
Rocker Arm Cover	9.48	9.50	9.75
Side Cover	9.18	9.50	9.75
Oil Pan	9.34**	9.64	9.63**
Valve Deck	9.50	9.50**	9.75
Pushrod Chamber	9.50	9.75	9.75
Timing Gear Cover	9.49	9.48	9.63
Average Ratings	9.4	9.6	9.7
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	9.02	9.00	6.18**
Anti-Thrust	9.10	8.98	7.38**
Rocker Arm Cover	6.83	6.00	6.875
Cylinder Walls			
Thrust	9.42	9.78	7.70
Anti-Thrust	9.50	9.80	7.62
Front	9.00	6.13	6.18
Back	9.00	6.48	6.30
Oil Pan	6.60	6.85	6.275
Lifter Bodies	9.36	9.40	9.20
Lifter Plungers	10.00	9.94	10.00
Average Ratings	8.8	8.2	7.4
Other Ratings			
Oil Ring, % Clogging	1.00	1.00	1.00
Oil Screen, % Clogging	<1.00	<1.00	<1.00
Push Rod, % Clogging	Open	Open	Open
Intake Valve Deposits	6.68	5.52	4.00
Ring Sticking	Free	Free	Free

* 10 = Clean

** This part contained "Grey Paint" deposits as a result of having been operated with gasoline with a relatively high lead content.

TABLE A-6. ENGINE INSPECTION DATA-RATINGS

Type Oil Minot AFB, ND Chevrolet, V-8, 350 CID	AFLRL No. (Vehicle No.) 30(79B1736) Green	 31(79B1759) Blue(C)
Sludge Ratings (Merit)*		
Left Rocker Arm Cover	9.49	9.66
Right Rocker Arm Cover	9.71	9.57
Oil Pan	9.33**	9.27
Underside of Intake Manifold	#	#
Left Valve Deck	9.75	9.75
Right Valve Deck	9.75	9.75
Push Rod Chamber	9.75	9.75
Timing Gear Cover	10.00	10.00
Average Ratings	9.7	9.7
Varnish Ratings (Merit)*		
Piston Skirts		
Thrust	7.48	8.76++
Anti-Thrust	7.28	8.81++
Left Rocker Arm Cover	5.85	7.00
Right Rocker Arm Cover	6.50	6.90
Cylinder Walls		
Thrust	8.44	9.50
Anti-Thrust	8.19	9.50
Front	7.90	9.31
Back	8.13	9.31
Oil Pan	6.75	6.975
Lifter Bodies	9.12##	9.15@
Lifter Plungers	9.85##	9.90
Average Ratings	7.8	8.6
Other Ratings		
Oil Ring, % Clogging	1.00	1.00
Oil Screen, % Clogging	1.00	<1.00
Push Rods, % Clogging	0.00	0.00
Intake Valve Deposits	6.69	6.50@@
Ring Sticking	Free+	Free

* 10 = Clean

** The A and B sludge depths looked like an oil emulsion (water in oil).

\# Not with engine when uncrated.

All lifter plungers had light to medium scuffing; all lifter bodies were cracked, chipped and worn; No. 15 lifter plunger showed severe wear; the cam lobe for lifter No. 15 was worn round (no lift).

\+ No rings on pistons No. 6 and No. 8; pistons No. 5 and No. 7 had oil emulsion under crown to ring land (as in ** above).

++ Piston No. 1 - 35% scuffing on anti-thrust side
No. 2 - 30% scuffing on anti-thrust side; coolant on ring land area
No. 3 - 25% scuffing on anti-thrust side; coolant on ring land area
No. 4 - 15% light scuffing on anti-thrust side
No. 5 - 45% scuffing on anti-thrust side
No. 6 - 5% light scuffing on anti-thrust side
No. 7 - 5% light scuffing on anti-thrust side
No. 8 - 70% scuffing on thrust side; 20% scuffing on anti-thrust side

@ No. 4 lifter body shows heavy wear; all show some scuffing (scuffed areas below wear areas).

@@ Looks like some of the deposits on intake valves had flaked off.

TABLE A-7. ENGINE INSPECTION DATA-RATINGS

Type Oil Myrtle Beach, SC Plymouth, 6 cyl, 225 CID	AFLRL No. (Vehicle No.) 37(79B5212) Green	 36(78B9187) Yellow	 41(78B9188) Blue(D)
Sludge Ratings (Merit)*			
Rocker Arm Cover	9.10	8.77	9.50
Oil Pan	9.15**	9.21	9.20
Valve Deck	9.75	9.65	9.75
Timing Gear Cover	#	#	#
Average Ratings	9.3	9.2	9.5
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	5.88	6.33	6.55
Anti-Thrust	5.38	6.28	6.72
Rocker Arm Cover	4.785	2.90	2.75
Cylinder Walls			
Thrust	7.58	7.82	7.48
Anti-Thrust	7.32	7.90	7.10
Front	6.43	6.08	6.65
Back	4.17	4.70	3.78
Oil Pan	5.20	3.875	5.27
Lifter Bodies			
(solid lifters)	7.24	5.94	4.74
Average Ratings	6.0	5.8	5.7
Other Ratings			
Oil Ring, % Clogging	1.00	1.00	1.00
Oil Screen, % Clogging	<1.00	<1.00	0.00
Intake Valve Deposits	6.30	5.52	5.92
Ring Sticking	Free	Free	Free

* 10 = Clean

** Piece of plastic oil pump gear found in oil pan; engine looks like it may have run awhile with no oil pressure.

\# The timing gear covers look like they were cleaned up or come from something else; "rusty".

TABLE A-8. ENGINE INSPECTION DATA-RATINGS

Oil Type Offutt AFB, NE Chevrolet, 6 cyl, 292 CID	AFLRL No. (Vehicle No.) 46(78B4766) Green	 45(78B4768) Blue(B)
Sludge Ratings (Merit)*		
Rocker Arm Cover	9.52	7.70**
Side Cover	9.50	7.50
Oil Pan	6.75	3.35
Valve Deck	9.75	7.50
Push Rod Chamber	9.75	7.50
Timing Gear Cover	5.04	6.90
Average Ratings	8.4	6.7
Varnish Ratings (Merit)*		
Piston Skirts		
Thrust	5.60	5.73#
Anti-Thrust	5.52	5.57
Rocker Arm Cover	4.35	5.08
Cylinder Walls		
Thrust	6.50	5.08
Anti-Thrust	6.75	5.25
Front	4.25	2.18
Back	3.95	2.28
Oil Pan	4.05	8.50
Lifter Bodies	9.80	8.36##
Lifter Plungers	10.00	10.00
Average Ratings	6.1	5.8
Other Ratings		
Oil Ring, % Clogging	1.00	2.00
Oil Screen, % Clogging	1.00	5.00
Push Rod, % Clogging	0.00	0.00
Intake Valve Deposits	6.58	6.22
Ring Sticking	Free	Free

* 10 = Clean

** This part contained "Grey Paint" deposits as a result of having been operated with gasoline with a relatively high lead content.

Wrist pins were tight in all cylinders.

With the exception of the No 4 lifter body these lifters did not look like they belonged to this engine (rating wise); No. 4 lifter body was rated 3 in the merit system (about one-third as much as each of the other lifters; lifter bodies No. 4, 5, 7, 8, 9, 10, 11, and 12 were worn to a concave surface ("dished") on top of rating area.

TABLE A-9. ENGINE INSPECTION DATA-RATINGS

Type Oil Peterson Field, CO Chevrolet, 6 cyl, 292 CID	AFLRL No. (Vehicle No.) 48(78B4569) Green	 44(78B4571) Yellow	 47(78B8831) Blue(C)
Sludge Ratings (Merit)*			
Rocker Arm Cover	9.75	9.60#	9.70
Side Cover	**	**	**
Oil Pan	9.6#	5.70#	9.15#
Valve Deck	9.75	9.50#	9.75
Push Rod Chamber	9.75	9.50#	9.75
Timing Gear Cover	**	**	**
Average Ratings	9.7	8.6	9.6
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	7.0	7.47@	5.85
Anti-Thrust	7.23	7.02	5.80
Rocker Arm Cover	8.00	7.90	6.72
Cylinder Walls			
Thrust	9.75	8.92	7.88
Anti-Thrust	9.80	9.00	8.02
Front	9.62	4.97	4.10
Back	9.57	5.23	3.13
Oil Pan	7.65	6.85@@	6.65
Lifter Bodies	9.75##	9.50	9.17++
Lifter Plungers	10.00	10.00	10.00
Average Ratings	8.8	7.7	6.7
Other Ratings			
Oil Ring, % Clogging	1.00	2.00	1.00
Oil Screen, % Clogging	0.00	1.00	0.00
Push Rod, % Clogging	0.00	**	0.00
Intake Valve Deposits	6.10	9.37	7.63
Ring Sticking	Free	Free+	Free

* 10 = Clean
** Not with engine when uncrated.
# These parts contained or exhibited "Grey Paint" deposits as a result of having been operated with gasoline with a relatively high lead content.
Lifter bodies No. 2, 3, 4, 8, 10 were chipped; No. 5 and 6 were cracked and chipped; No. 12 was cracked.
@ "Grey Paint" made rating difficult, however, the ratings given are the best judgement under the circumstances.
@@ Some rust was noted at inspection sites No. 1, 5 through 9, 12 through 15, and 20.
+ Top ring sluggish in pistons 1 and 2; wrist pins tight in all pistons.
++ Lifter bodies No. 1, 3, 4, 5, 6 and 10 were worn to a concave surface at top of rated area; No. 7 was chipped on top edge of rated area.

TABLE A-10. ENGINE INSPECTION DATA-RATINGS

Type Oil Randolph AFB, TX Ford, 4 cyl, 140 CID	AFLRL No. (Vehicle No.) 20(79B5721) Green	 21(79B5719) Yellow	 22(79B5720) Blue(A)
Sludge Ratings (Merit)*			
Rocker Arm Cover	9.75	9.75	9.40
Front Seal Housing	9.50	9.50	9.00
Oil Pan	9.59	9.40	9.40
Valve Deck	9.75	9.75	9.50
Underside of Block	9.75	9.75	9.50
Average Ratings	9.7	9.6	9.4
Varnish Ratings (Merit)*			
Piston Skirts			
Thrust	7.95	8.83	6.75
Anti-Thrust	8.20	9.10	6.75
Rocker Arm Cover	6.00	5.35	6.75
Cylinder Walls			
Thrust	10.00	10.00	7.625
Anti-Thrust	10.00	9.99	[illegible]30
Front	10.00	9.50	6.675
Back	10.00	9.75	6.575
Oil Pan	9.00	7.75	6.975
Average Ratings	8.9	8.8	7.1
Other Ratings			
Oil Ring, % Clogging	<1.00	<1.00	<1.00
Oil Screen, % Clogging	<1.00	<1.00	1.00
Intake Valve Deposits	5.88	7.15	6.70
Ring Sticking	Free	Free	Free

* 10 = Clean

APPENDIX B

ENGINE INSPECTION DATA-WEAR MEASUREMENTS

NOTE

In this appendix, tables are positioned so that tables using English measurements face the same table using its metric equivalents. For example, pages B-4 and B-5 report on the same items; however, page B-4 uses inches as measurement while page B-5 uses the metric system of measurements.

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5659
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.028		0.029		0.026		0.029		0.030		0.031	
Bottom	0.026		0.028		0.026		0.026		0.028		0.029	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.6824	3.6830	3.6817	3.6823	3.6824	3.6832	3.6817	3.6823	3.6804	3.6831	3.6824	3.6817
Middle	3.6811	3.6820	3.6805	3.6812	3.6814	3.6823	3.6808	3.6818	3.6813	3.6824	3.6810	3.6820
Bottom	3.6811	3.6823	3.6805	3.6816	3.6815	3.6825	3.6809	3.6805	3.6811	3.6824	3.6808	3.6822
Out-of-round	0.0006		0.0006		0.0008		0.0006		0.0027		0.0007	
Taper	0.0013		0.0012		0.0009		0.0008		0.0007		0.0016	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1232	2.1230	2.1235	2.1235	2.1230	2.1230	2.1230	2.1230	2.1230	2.1230	2.1230	2.1230
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1270	2.1270	2.1268	2.1266	2.1269	2.1267	2.1260	2.1260	2.1260	2.1262	2.1260	2.1264
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.244	0.243	0.243	0.242	0.248	0.249	0.139	0.247	0.257	0.252	0.258	0.131
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0014	0.0014	0.0014	0.0013	0.0014	0.0014	0.0014	0.0015	0.0013	0.0014	0.0015	0.0014
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	53	55	54	55	54	55	54	53	54	55	55	56
Piston Avg. Diameter												
Middle and bottom of skirt	3.6800		3.6793		3.6802		3.6807		3.6806		3.6798	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2478	2.2479	2.2480	2.2482	2.2478	2.2480	2.2478	2.2478	2.2480	2.2480	2.2480	2.2480	2.2479	2.2479
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.2500	2.5050	2.2499	2.2498	2.2499	2.2499	2.2499	2.2498	2.2500	2.2499	2.2499	2.2499	2.2500	2.2500

Manufacturer's Service Limits, Inches

Compression Ring Gaps	
Top	0.008-0.016
Bottom	
Cylinder Bore Diameter	3.6800-3.6848
Out-of-round	0.005
Taper	0.010
Connecting Rod Bearings	
Journal Diameter	2.1232-2.1240
Shell Diameter	2.1240-2.1255
Camshaft Lobe Lift	
Intake	0.245
Exhaust	
Valve Stem to Guide Clearance	
Intake	0.0008-0.0025
Exhaust	0.0010-0.0027
Valve Spring Force	
Intake	51-57 lb @ 1.59"
Exhaust	
Piston Diameter	3.6796-3.6802
Main Bearings	
Journal Diameter	2.2482-2.2490
Shell Diameter	2.2490-2.2505

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5659
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.71+		0.74		0.66		0.74		0.76		0.78	
Bottom	0.66		0.71		0.66		0.66		0.71		0.74	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	93.533	93.548	93.515	93.530	93.533	93.553	93.515	93.530	93.482	93.551	93.533	93.515
Middle	93.500	93.523	93.485	93.502	93.508	93.530	93.492	93.518	93.505	93.533	93.497	93.523
Bottom	93.500	93.530	93.485	93.513	93.510	93.536	93.495	93.485	93.500	93.533	93.492	93.528
Out-of-round	0.015		0.015		0.020		0.015		0.069		0.018	
Taper	0.033		0.030		0.023		0.020		0.018		0.041	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.929	53.924	53.937	53.937	53.924	53.924	53.924	53.924	53.924	53.924	53.924	53.924
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	54.026	54.026	54.021	54.016	54.023	54.018	54.000	54.000	54.000	54.005	54.000	54.011
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.20	6.17	6.17	6.15	6.30	6.32	3.53	6.27	6.53	6.40	6.55	3.33
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.036	0.036	0.036	0.033	0.036	0.036	0.036	0.038	0.033	0.036	0.038	0.036
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	236	245	240	245	240	245	240	236	240	245	245	249
Piston Avg. Diameter												
Middle and bottom of skirt	93.472		93.454		93.477		93.490		93.487		93.467	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	57.094	57.097	57.099	57.104	57.094	57.099	57.094	57.094	57.099	57.099	57.099	57.099	57.097	57.097
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	57.150	57.163	57.147	57.145	54.147	54.147	54.147	57.145	57.150	57.147	57.147	57.147	57.150	57.150

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	93.462-93.477
Top	0.20-0.41	Intake	6.22	Main Bearings	
Bottom		Exhaust		Journal Diameter	57.104-57.125
Cylinder Bore Diameter	93.472-93.594	Valve Stem to Guide Clearance		Shell Diameter	57.125-57.163
Out-of-round	0.13	Intake	0.020-0.064		
Taper	0.25	Exhaust	0.025-0.069		
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.929-53.950	Intake	227-254 (N-m) @ 40.4 mm		
Shell Diameter	53.950-53.988	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5660
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.028		0.025		0.026		0.028		0.027		0.025	
Bottom	0.025		0.024		0.025		0.029		0.027		0.026	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.6835	3.6835	3.6821	3.6826	3.6829	3.6827	3.6821	3.6831	3.6824	3.6831	3.6824	3.6831
Middle	3.6819	3.6832	3.6813	3.6821	3.6812	3.6824	3.6814	3.6825	3.6812	3.6826	3.6814	3.6828
Bottom	3.6819	3.6834	3.6811	3.6823	3.6812	3.6824	3.6815	3.6824	3.6814	3.6827	3.6816	3.6831
Out-of-round	0.0001		0.0005		0.0002		0.0010		0.0007		0.0007	
Taper	0.0016		0.0010		0.0017		0.0006		0.0010		0.0008	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1236	2.1234	2.1230	2.1230	2.1230	2.1230	2.1230	2.1234	2.1230	2.1230	2.1230	2.1232
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1260	2.1262	2.1264	2.1264	2.1269	2.1269	2.1275	2.1270	2.1270	2.1268	2.1270	2.1270
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.244	0.240	0.240	0.239	0.240	0.244	0.244	0.243	0.244	0.243	0.241	0.240
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0020	0.0019	0.0018	0.0018	0.0020	0.0020	0.0018	0.0019	0.0019	0.0020	0.0020	0.0021
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	55	55	54	54	55	55	56	54	56	55	55	55
Piston Avg. Diameter												
Middle and bottom of skirt	3.6808		3.6793		3.6799		3.6797		3.6804		3.6797	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2485	2.2482	2.2480	2.2484	2.2484	2.2485	2.2480	2.2480	2.2480	2.2482	2.2480	2.2480	2.2480	2.2480
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.2505	2.2508	2.2504	2.2502	2.2502	2.2502	2.2504	2.2505	2.2512	2.2502	2.2502	2.2504	2.2500	2.2500

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter		3.6796-3.6802
Top	0.008-0.016	Intake	0.245	Main Bearings		
Bottom		Exhaust	0.245	Journal Diameter		2.2482-2.2490
Cylinder Bore Diameter	3.6800-3.6848	Valve Stem to Guide Clearance		Shell Diameter		2.2490-2.2505
Out-of-round	0.005	Intake	0.0008-0.0025			
Taper	0.010	Exhaust	0.0010-0.0027			
Connecting Rod Bearings		Valve Spring Force				
Journal Diameter	2.1232-2.1240	Intake	51-57 lb @ 1.59"			
Shell Diameter	2.1240-2.125[illegible]	Exhaust				

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5660
TYPE OIL: YELLOW

Component	Cylinder No. 1	2	3	4	5	6
Compression Ring Gaps						
Top	0.71*	0.64	0.66	0.71	0.69	0.64
Bottom	0.64	0.61	0.64	0.74	0.69	0.66
Cylinder Bore Diameter	L / T	L / T	L / T	L / T	L / T	L / T
Top	93.561 / 93.563	93.525 / 93.538	93.546 / 93.541	93.525 / 93.551	93.533 / 93.551	93.533 / 93.551
Middle	93.520 / 93.553	93.505 / 93.525	93.502 / 93.533	93.508 / 93.536	93.502 / 93.538	93.508 / 93.543
Bottom	93.520 / 93.558	93.500 / 93.530	93.502 / 93.533	93.510 / 93.533	93.508 / 93.541	93.513 / 93.551
Out-of-round	0.002	0.013	0.005	0.026	0.018	0.018
Taper	0.041	0.025	0.044	0.015	0.025	0.020
Connecting Rod Bearings						
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V
	53.939 / 53.934	53.924 / 53.924	53.924 / 53.924	53.924 / 53.934	53.924 / 53.924	53.924 / 53.930
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B
	54.000 / 54.005	54.011 / 54.011	54.023 / 54.023	54.039 / 54.026	54.026 / 54.021	54.026 / 54.026
Camshaft Lobe Lift	I / E	I / E	I / E	I / E	I / E	I / E
	6.20 / 6.10	6.10 / 6.07	6.10 / 6.20	6.20 / 6.17	6.20 / 6.17	6.12 / 6.10
Valve Stem to Guide Clearance	I / E	I / E	I / E	I / E	I / E	I / E
	0.051 / 0.048	0.046 / 0.046	0.051 / 0.051	0.046 / 0.048	0.048 / 0.051	0.051 / 0.053
Valve Spring Force@	I / E	I / E	I / E	I / E	I / E	I / E
	245 / 245	240 / 240	245 / 245	249 / 240	249 / 245	245 / 245
Piston Avg. Diameter						
Middle and bottom of skirt	93.492	93.454	93.469	93.464	93.482	93.464

Main Bearings	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V	H / V
	57.112 / 57.104	57.099 / 57.109	57.109 / 57.112	57.099 / 57.099	57.099 / 57.104	57.099 / 57.099	57.099 / 57.099
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B	F / B
	57.163 / 57.170	57.160 / 57.155	57.155 / 57.155	57.160 / 57.163	57.180 / 57.155	57.155 / 57.160	57.150 / 57.150

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	93.462-93.477
Top	0.20-0.41	Intake	6.22	Main Bearings	
Bottom		Exhaust		Journal Diameter	57.104-57.125
Cylinder Bore Diameter	93.472-93.594	Valve Stem to Guide Clearance		Shell Diameter	57.125-57.163
Out-of-round	0.13	Intake	0.020-0.064		
Taper	0.25	Exhaust	0.025-0.069		
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.929-53.950	Intake	227-254 (N-m) @ 40.4 mm		
Shell Diameter	53.950-53.988	Exhaust			

@L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5668
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.030		0.026		0.028		0.028		0.028		0.028	
Bottom	0.024		0.028		0.027		0.024		0.027		0.026	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.6824	3.6827	3.6818	3.6824	3.6818	3.6830	3.6816	3.6823	3.6824	3.6831	3.6823	3.6826
Middle	3.6811	3.6821	3.6806	3.6819	3.6812	3.6824	3.6809	3.6818	3.6812	3.6824	3.6810	3.6820
Bottom	3.6812	3.6824	3.6807	3.6819	3.6812	3.6818	3.6812	3.6819	3.6814	3.6826	3.6809	3.6823
Out-of-round	0.0003		0.0006		0.0012		0.0007		0.0007		0.0003	
Taper	0.0012		0.0011		0.0006		0.0004		0.0010		0.0014	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1228	2.1229	2.1230	2.1230	2.1232	2.1232	2.1230	2.1230	2.1225	2.1226	2.1228	2.1228
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1260	2.1258	2.1255	2.1253	2.1250	2.1250	2.1255	2.1260	2.1252	2.1250	2.1259	2.1253
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.244	0.243	0.244	0.244	0.245	0.244	0.244	0.244	0.244	0.244	0.244	0.244
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0014	0.0015	0.0015	0.0016	0.0015	0.0016	0.0014	0.0014	0.0015	0.0015	0.0015	0.0014
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	54	55	55	55	56	54	54	55	56	54	54	55
Piston Avg. Diameter												
Middle and bottom of skirt	3.6802		3.6797		3.6798		3.6791		3.6788		3.6795	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2482	2.2480	2.2482	2.2482	2.2482	2.2480	2.2480	2.2480	2.2480	2.2480	2.2480	2.2480	2.2480	2.2480
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.2508	2.2508	2.2500	2.2502	2.2502	2.2504	2.2500	2.2502	2.2508	2.2506	2.2505	2.2504	2.2500	2.2502

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.6796-3.6802
Top	0.008-0.016	Intake	0.245	Main Bearings	
Bottom		Exhaust	0.245	Journal Diameter	2.2482-2.2490
Cylinder Bore Diameter	3.6800-3.6848	Valve Stem to Guide Clearance		Shell Diameter	2.2490-2.2505
Out-of-round	0.005	Intake	0.0008-0.0025		
Taper	0.010	Exhaust	0.0010-0.0027		
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1232-2.1240	Intake	51-57 lb @ 1.59"		
Shell Diameter	2.1240-2.1255	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
U.S. AIR FORCE ACADEMY
ENGINE TYPE: FORD, 6 CYLINDER, 200 CID
VEHICLE NO. 79B5668
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.76+		0.66		0.71		0.71		0.71		0.71	
Bottom	0.61		0.71		0.69		0.61		0.69		0.66	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	93.533	93.541	93.518	93.533	93.518	93.548	93.513	93.530	93.533	93.551	93.530	93.538
Middle	93.500	93.525	93.487	93.520	93.502	93.533	93.495	93.518	93.508	93.533	93.497	93.523
Bottom	93.502	93.533	93.490	93.520	93.502	93.518	93.502	93.520	93.508	93.538	93.495	93.530
Out-of-round	0.008		0.015		0.030		0.017		0.018		0.008	
Taper	0.031		0.028		0.016		0.011		0.025		0.035	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.919	53.922	53.924	53.924	53.929	53.929	53.924	53.924	53.912	53.914	53.919	53.919
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	54.000	53.995	53.998	53.983	53.975	53.975	53.988	54.000	53.975	53.975	53.998	53.983
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.20	6.07	6.20	6.20	6.22	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.036	0.038	0.038	0.041	0.038	0.041	0.036	0.036	0.038	0.038	0.038	0.036
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	240	245	245	245	249	240	240	245	249	240	240	245
Piston Avg. Diameter												
Middle and bottom of skirt	93.477		93.464		93.467		93.449		93.442		93.459	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	57.104	57.099	57.104	57.104	57.104	57.099	57.099	57.099	57.099	57.099	57.099	57.099	57.099	57.099
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	57.170	57.170	57.150	57.155	57.155	57.160	57.150	57.155	57.170	57.165	57.163	57.160	57.150	57.155

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift:	
Top	0.20-0.41	Intake	6.22
Bottom		Exhaust	
Cylinder Bore Diameter	93.472-93.594	Valve Stem to Guide Clearance	
Out-of-round	0.13	Intake	0.020-0.064
Taper	0.25	Exhaust	0.025-0.069
Connecting Rod Bearings		Valve Spring Force	
Journal Diameter	53.929-53.950	Intake	227-254 (N-m) @ 40.4 mm
Shell Diameter	53.950-53.988	Exhaust	

Piston Diameter	93.462-93.477
Main Bearings	
Journal Diameter	57.104-57.125
Shell Diameter	57.125-57.163

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2533
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.028		0.029		0.027		0.030		0.025		0.027		0.025		0.029	
Bottom	0.025		0.030		0.027		0.029		0.023		0.027		0.025		0.029	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	3.9121	3.9118	3.9122	3.9118	3.9117	3.9108	3.9119	3.9118	3.9118	3.9113	3.9121	3.9119	3.9115	3.9116	3.9122	3.9124
Middle	3.9112	3.9118	3.9112	3.9122	3.9109	3.9128	3.9105	3.9120	3.9107	3.9117	3.9105	3.9121	3.9106	3.9120	3.9112	3.9124
Bottom	3.9115	3.9120	3.9116	3.9124	3.9122	3.9128	3.9112	3.9119	3.9115	3.9119	3.9112	3.9121	3.9109	3.9121	3.9118	3.9126
Out-of-round	0.0003		0.0004		0.0009		0.0001		0.0005		0.0002		0.0001		0.0002	
Taper	0.0006		0.0006		0.0005		0.0007		0.0003		0.0009		0.0006		0.0004	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.1240	2.1241	2.1241	2.1240	2.1239	2.1240	2.1239	2.1940	2.1240	2.1241	2.1240	2.1240	2.1241	2.1242	2.1242	2.1241
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1260	2.1260	2.1258	2.1255	2.1254	2.1252	2.1255	2.1258	2.1259	2.1260	2.1260	2.1258	2.1258	2.1260	2.1259	2.1258
Camshaft Lobe																
Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.243	0.245	0.235	0.254	0.253	0.239	0.257	0.238	0.230	0.256	0.235	0.257	0.253	0.237	0.250	0.236
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0017	0.0016	0.0018	0.0017	0.0017	0.0017	0.0016	0.0017	0.0017	0.0018	0.0018	0.0018	0.0017	0.0018	0.0017	0.0017
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	84	85	85	84	84	83	85	84	85	85	85	84	83	84	85	85
Piston Avg.Diameter Middle & bottom of Skirt	3.9105		3.9108		3.9110		3.9111		3.9095		3.9106		3.9099		3.9109	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4998	2.4995	illegible	illegible	2.4998	2.4998	2.4999	2.5000	2.4998	2.4996
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.5005	2.5010	illegible	illegible	2.5012	2.5010	2.5015	2.5018	2.5018	2.5015

Limits, Inches

Compression Ring Gaps		Piston Diameter	3.9085-3.9115
Top	0.010-illegible	Main Bearings	
Bottom	illegible	Journal Diameter	2.4995-2.5005
Cylinder Bore Diameter	3.9100-illegible	Shell Diameter	2.5000-2.5030
Out-of-round	0.00illegible		
Taper	0.00illegible	illegible 0.0017	
Connecting Rod Bearings			
Journal Diameter	2.1240-illegible	illegible 2.1241/16"	
Shell Diameter	2.1245-illegible		

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2533
TYPE OIL: GREEN

Component	Cylinder No. 1	2	3	4	5	6	7	8
Compression Ring								
Gaps								
Top	0.71*	0.74	0.69	0.76	0.64	0.69	0.64	0.74
Bottom	0.64	0.76	0.69	0.74	0.58	0.69	0.64	0.74
Cylinder Bore								
Diameter	L / T	L / T	L / T	L / T	L / T	L / T	L / T	L / T
Top	99.367 / 99.360	99.370 / 99.360	99.357 / 99.334	99.362 / 99.360	99.360 / 99.347	99.367 / 99.362	99.352 / 99.355	99.370 / 99.375
Middle	99.344 / 99.360	99.344 / 99.370	99.337 / 99.385	99.327 / 99.365	99.332 / 99.357	99.327 / 99.367	99.329 / 99.365	99.344 / 99.375
Bottom	99.352 / 99.365	99.355 / 99.375	99.370 / 99.385	99.344 / 99.362	99.352 / 99.362	99.344 / 99.367	99.337 / 99.367	99.360 / 99.380
Out-of-round	0.007	0.010	0.013	0.002	0.013	0.005	0.013	0.005
Taper	0.015	0.015	0.013	0.018	0.008	0.023	0.015	0.010
Connecting Rod								
Bearings								
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V	H / V	H / V
	53.950 / 53.952	53.952 / 53.950	53.947 / 53.950	53.947 / 53.950	53.950 / 53.952	53.950 / 53.950	53.952 / 53.955	53.955 / 53.952
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B	F / B	F / B
	54.000 / 54.000	53.995 / 53.988	53.985 / 53.980	53.988 / 53.995	53.998 / 54.000	54.000 / 53.995	53.995 / 54.000	53.998 / 53.995
Camshaft Lobe								
Lift	I / E	I / E	I / E	I / E	I / E	I / E	I / E	I / E
	6.17 / 6.22	5.97 / 6.45	6.43 / 6.07	6.53 / 6.05	5.84 / 6.50	5.97 / 6.53	6.43 / 6.02	6.35 / 5.99
Valve Stem to								
Guide Clearance	I / E	I / E	I / E	I / E	I / E	I / E	I / E	I / E
	0.043 / 0.041	0.046 / 0.043	0.043 / 0.043	0.041 / 0.043	0.043 / 0.046	0.046 / 0.046	0.043 / 0.046	0.043 / 0.043
Valve Spring								
Force	I / E	I / E	I / E	I / E	I / E	I / E	I / E	I / E
	374 / 378	378 / 374	374 / 369	378 / 374	378 / 378	378 / 374	369 / 374	378 / 378
Piston Avg. Diameter								
Middle & bottom of skirt	99.327	99.334	99.339	99.342	99.301	99.329	99.311	99.337
Main Bearings	No. 1	No. 2	No. 3	No. 4	No. 5			
Journal Diameter	H / V	H / V	H / V	H / V	H / V			
	63.494 / 63.487	63.495 / 63.497	63.495 / 63.495	63.497 / 63.500	63.495 / 63.490			
Shell Diameter	F / B	F / B	F / B	F / B	F / B			
	63.513 / 63.510	63.503 / 63.503	63.530 / 63.525	63.538 / 63.546	63.546 / 63.538			

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	99.276-99.352
Top	0.25-0.51	Intake	6.32	Main Bearings	
Bottom		Exhaust		Journal Diameter	63.487-63.513
Cylinder Bore Diameter	99.314-99.365	Valve Stem to Guide Clearance		Shell Diameter	63.500-63.576
Out-of-round	0.13	Intake	0.03-0.43		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.950-53.975	Intake	347-391 N-m @ 42.9 mm		
Shell Diameter	53.962-54.039	Exhaust			

[a] L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
** = Measurements are in (mm)

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2534
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.025		0.024		0.026		0.028		0.024		0.029		0.023		0.027	
Bottom	0.025		0.026		0.026		0.026		0.024		0.028		0.026		0.027	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	3.9112	3.9110	3.9108	3.9105	3.9109	3.9109	3.9104	3.9104	3.9113	3.9113	3.9104	3.9102	3.9111	3.9106	3.9102	3.9109
Middle	3.9104	3.9109	3.9093	3.9106	3.9103	3.9109	3.9094	3.9106	3.9104	3.9116	3.9092	3.9105	3.9101	3.9111	3.9096	3.9104
Bottom	3.9104	3.9109	3.9093	3.9107	3.9103	3.9109	3.9100	3.9106	3.9108	3.9116	3.9097	3.9104	3.9103	3.9111	3.9100	3.9104
Out-of-round	0.0002		0.0003		0.0000		0.0000		0.0000		0.0002		0.0005		0.0007	
Taper	0.0008		0.0015		0.0006		0.0004		0.0005		0.0007		0.0008		0.0002	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.1245	2.1242	2.1245	2.1245	2.1246	2.1246	2.1246	2.1246	2.1246	2.1245	2.1245	2.1245	2.1245	2.1245	2.1245	2.1245
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1270	2.1268	2.1270	2.1267	2.1268	2.1265	2.1262	2.1262	2.1269	2.1268	2.1265	2.1268	2.1262	2.1263	2.1264	2.1260
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.238	0.257	0.239	0.257	0.255	0.238	0.261	0.240	0.240	0.258	0.238	0.243	0.215	0.237	0.254	0.236
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0013	0.0014	0.0015	0.0015	0.0015	0.0014	0.0014	0.0015	0.0014	0.0014	0.0015	0.0014	0.0015	0.0013	0.0014	0.0016
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	85	85	84	84	85	84	85	85	85	84	85	85	85	84	84	85
Piston Avg. Diameter Middle & bottom of skirt	3.9098		3.9101		3.9102		3.9102		3.9103		3.9102		3.9104		3.9100	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4495	2.4495	2.4496	2.4498	2.5008	2.5008	2.5002	2.5002	2.4499	2.5000
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.5019	2.5015	2.5020	2.5025	2.5022	2.5016	2.5018	2.5018	2.5024	2.5022

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9085-3.9115
Top	0.010-0.020	Intake	0.249	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.4995-2.5005
Cylinder Bore Diameter	3.9100-3.9120	Valve Stem to Guide Clearance		Shell Diameter	2.5000-2.5030
Out-of-round	0.005	Intake	0.001-0.017		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1240-2.1250	Intake	78-88 lb @ 1 11/16"		
Shell Diameter	2.1245-2.1275	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2534
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.64*		0.61		0.66		0.71		0.61		0.74		0.58		0.69	
Bottom	0.64		0.66		0.66		0.66		0.61		0.71		0.66		0.69	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	99.344	99.339	99.334	99.327	99.337	99.337	99.324	99.324	99.347	99.347	99.324	99.319	99.342	99.329	99.319	99.337
Middle	99.324	99.337	99.296	99.329	99.309	99.337	99.299	99.330	99.324	99.355	99.294	99.327	99.317	99.342	99.304	99.324
Bottom	99.324	99.337	99.296	99.332	99.322	99.337	99.314	99.330	99.334	99.355	99.306	99.324	99.322	99.342	99.324	99.324
Out-of-round	0.005		0.007		0.000		0.000		0.000		0.005		0.013		0.018	
Taper	0.020		0.038		0.015		0.010		0.013		0.018		0.020		0.005	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.692	53.955	53.962	53.962	53.965	53.965	53.965	53.965	53.965	53.962	53.962	53.962	53.962	53.962	53.962	53.962
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	54.026	54.021	54.026	54.018	54.021	54.013	54.005	54.005	54.023	54.021	54.013	54.021	54.005	54.008	54.011	54.000
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	6.05	6.53	6.07	6.53	6.48	6.05	6.63	6.10	6.10	6.55	6.05	6.17	5.46	6.02	6.45	5.99
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.033	0.036	0.038	0.038	0.038	0.036	0.036	0.038	0.036	0.036	0.038	0.036	0.038	0.033	0.036	0.041
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	378	378	374	374	378	374	378	378	378	374	378	378	378	374	374	378
Piston Avg. Diameter Middle & bottom of skirt	99.309		99.317		99.319		99.319		99.322		99.319		99.324		99.314	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	62.217	62.217	62.220	62.225	63.520	63.520	63.505	53.505	62.227	63.500
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	63.548	63.538	63.551	63.564	63.556	63.541	63.546	63.546	63.561	63.556

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	99.276-99.352
Top	0.25-0.51	Intake	6.32	Main Bearings	
Bottom		Exhaust		Journal Diameter	63.487-63.513
Cylinder Bore Diameter	99.314-99.365			Shell Diameter	63.500-63.576
Out-of-round	0.013	Valve Stem to Guide Clearance			
Taper	0.25	Intake	0.03-0.43		
Connecting Rod Bearings		Exhaust			
Journal Diameter	53.950-53.975	Valve Spring Force			
Shell Diameter	53.962-54.039	Intake	347-391 N-m @ 42.9 mm		
		Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2539
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.025		0.026		0.025		0.026		0.025		0.023		0.026		0.025	
Bottom	0.026		0.026		0.027		0.024		0.027		0.024		0.029		0.023	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	3.9110	3.9105	3.9118	3.9115	3.9110	3.9111	3.9110	3.9110	3.9113	3.9110	3.9122	3.9120	3.9116	3.9118	3.9112	3.9113
Middle	3.9105	3.9110	3.9109	3.9114	3.9103	3.9112	3.9101	3.9112	3.9105	3.9113	3.9110	3.9119	3.9107	3.9117	3.9103	3.9106
Bottom	3.9107	3.9112	3.9111	3.9118	3.9109	3.9112	3.9106	3.9112	3.9110	3.9114	3.9115	3.9119	3.9109	3.9117	3.9105	3.9106
Out-of-round	0.0005		0.0003		0.0001		0.0000		0.0003		0.0002		0.0002		0.0001	
Taper	0.0003		0.0007		0.0001		0.0004		0.0003		0.0007		0.0007		0.0007	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.1238	2.1242	2.1238	2.1240	2.1241	2.1240	2.1239	2.1939	2.1238	2.1237	2.1238	2.1236	2.1240	2.1240	2.1239	2.1241
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1262	2.1264	2.1265	2.1253	2.1265	2.1259	2.1264	2.1258	2.1264	2.1265	2.1265	2.1267	2.1260	2.1265	2.1265	2.1264
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.234	0.254	0.237	0.250	0.251	0.234	0.251	0.239	0.233	0.251	0.234	0.254	0.247	0.232	0.250	0.235
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0019	0.0020	0.0021	0.0022	0.0020	0.0021	0.0020	0.0020	0.0018	0.0019	0.0020	0.0020	0.0019	0.0020	0.0018	0.0019
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	85	84	84	84	85	85	85	84	84	84	85	85	85	83	85	84
Piston Avg. Diameter Middle & bottom of skirt	3.9098		3.9102		3.9095		3.9111		3.9090		3.9101		3.9097		3.9089	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4992	2.4990	2.4995	2.4995	2.4994	2.4995	2.4996	2.4995	2.4995	2.4993
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.5015	2.5017	2.5015	2.5012	2.5019	2.5014	2.5014	2.5015	2.5012	2.5018

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter		3.9085-3.9115
Top	0.010-0.020	Intake	0.249	Main Bearings		
Bottom		Exhaust		Journal Diameter		2.4995-2.5005
Cylinder Bore Diameter	3.9100-3.9120	Valve Stem to Guide Clearance		Shell Diameter		2.5000-2.5030
Out-of-round	0.005	Intake	0.001-0.017			
Taper	0.010	Exhaust				
Connecting Rod Bearings		Valve Spring Force				
Journal Diameter	2.1240-2.1250	Intake	78-88 lb @ 1 11/16"			
Shell Diameter	2.1245-2.1275	Exhaust				

ENGINE COMPONENTS MEASUREMENTS
GEORGE AIR FORCE BASE
ENGINE TYPE: DODGE, V-8, 318 CID
VEHICLE NO. 79B2539
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.64*		0.66		0.64		0.66		0.64		0.58		0.66		0.64	
Bottom	0.66		0.66		0.69		0.61		0.69		0.61		0.74		0.58	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	99.339	99.327	99.360	99.352	99.339	99.342	99.339	99.339	99.347	99.339	99.370	99.365	99.355	99.360	99.344	99.347
Middle	99.327	99.339	99.337	99.350	99.322	99.344	99.312	99.344	99.327	99.347	99.339	99.362	99.332	99.357	99.322	99.329
Bottom	99.332	99.344	99.342	99.360	99.337	99.344	99.329	99.344	99.339	99.350	99.352	99.362	99.337	99.357	99.327	99.329
Out-of-round	0.012		0.008		0.003		0.000		0.008		0.005		0.005		0.017	
Taper	0.007		0.018		0.002		0.010		0.008		0.018		0.018		0.017	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.945	53.955	53.945	53.950	53.952	53.950	53.947	53.947	53.945	53.942	53.945	53.939	53.950	53.950	53.947	53.952
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	54.005	54.011	54.013	53.983	54.103	53.998	54.011	53.995	54.011	54.013	54.013	54.018	54.000	54.013	54.013	54.011
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	5.944	6.452	6.020	6.350	6.380	5.944	6.375	6.071	5.918	6.375	5.944	6.452	6.274	5.893	6.350	5.969
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.048	0.051	0.053	0.056	0.051	0.053	0.051	0.051	0.046	0.048	0.051	0.051	0.048	0.051	0.046	0.048
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	378	374	374	374	378	378	378	374	374	374	378	378	378	369	378	374
Piston Avg.Diameter Middle & bottom of skirt	99.301		99.090		99.301		99.342		99.289		99.317		99.306		99.286	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	63.480	63.475	63.487	63.487	63.485	63.487	63.490	63.487	63.475	63.482
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	63.538	63.543	63.538	63.530	63.548	63.536	63.536	63.536	63.530	63.546

Manufacturer's Service Limits, (mm)

Compression Ring Gaps	Camshaft Lobe Lift	Piston Diameter	99.276-99.352
Top	0.25-0.51	Intake	6.32	Main Bearings	
Bottom		Exhaust		Journal Diameter	63.487-63.513
				Shell Diameter	63.500-63.576
Cylinder Bore Diameter	99.314-99.365	Valve Stem to Guide Clearance			
Out-of-round	0.13	Intake	0.03-0.43		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.950-53.975	Intake	347-391 N-m @ 42.9 mm		
Shell Diameter	53.962-54.039	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
GRAND FORKS AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1734
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.021		0.025		0.025		0.024		0.024		0.022		0.024		0.027	
Bottom	0.025		0.022		0.025		0.022		0.024		0.022		0.029		0.025	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	4.0015	4.0009	4.0020	4.0018	4.0025	4.0019	4.0022	4.0021	4.0020	4.0011	4.0028	4.0024	4.0022	4.0019	4.0017	4.0013
Middle	4.0003	4.0008	4.0004	4.0015	4.0004	4.0018	4.0006	4.0014	4.0008	4.0007	4.0013	4.0023	4.0005	4.0016	4.0007	4.0011
Bottom	4.0006	4.0010	4.0006	4.0012	4.0008	4.0015	4.0008	4.0014	4.0009	4.0008	4.0016	4.0021	4.0009	4.0013	4.0008	4.0013
Out-of-round	0.0006		0.0002		0.0006		0.0001		0.0009		0.0004		0.0003		0.0004	
Taper	0.0009		0.0014		0.0017		0.0014		0.0011		0.0012		0.0013		0.0009	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.0996	2.0995	2.0995	2.0995	2.0990	2.0990	2.0995	2.0995	2.0995	2.0995	2.0995	2.0995	2.0990	2.0990	2.0990	2.0990
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1025	2.1020	2.1025	2.1020	2.1020	2.1024	2.1020	2.1022	2.1020	2.1021	2.1029	2.1029	2.1018	2.1018	2.1025	2.1025
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.261	0.276	0.258	0.266	0.268	0.271	0.259	0.263	0.265	0.266	0.260	0.274	0.254	0.270	0.257	0.265
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0012	0.0015	0.0015	0.0016	0.0013	0.0014	0.0016	0.0017	0.0015	0.0016	0.0014	0.0015	0.0016	0.0017	0.0014	0.0016
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	76	78	79	75	76	77	78	77	76	78	76	75	77	78	78	77
Piston Avg.Diameter Middle & bottom of skirt	3.9988		3.9989		3.9989		3.9994		3.9992		3.9989		3.9994		3.9983	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4485	2.4485	2.4480	2.4480	2.4485	2.4484	2.4488	2.4486	2.4485	2.4485
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.4524	2.4523	2.4522	2.4522	2.4515	2.4520	2.4520	2.4520	2.4519	2.4518

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9968-4.0018
Top	0.010-0.035	Intake	0.258-0.262	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.4479-2.4493
Cylinder Bore Diameter	3.9995-4.0025	Valve Stem to Guide Clearance		Shell Diameter	2.4504-2.4528
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0988-2.0998	Intake	76-84 lb @ 1.70"		
Shell Diameter	2.1001-2.1033	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
GRAND FORKS AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1734
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.53*		0.64		0.64		0.61		0.61		0.66		0.61		0.69	
Bottom	0.64		0.56		0.64		0.56		0.61		0.56		0.74		0.64	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.638	101.623	101.651	101.646	101.664	101.648	101.656	101.653	101.651	101.628	101.671	101.661	101.656	101.648	101.643	101.633
Middle	101.608	101.620	101.610	101.638	101.610	101.646	101.615	101.636	101.620	101.618	101.633	101.658	101.613	101.641	101.618	101.628
Bottom	101.615	101.625	101.615	101.630	101.620	101.638	101.620	101.636	101.623	101.620	101.641	101.653	101.623	101.633	101.620	101.633
Out-of-round	0.015		0.005		0.016		0.003		0.023		0.010		0.008		0.010	
Taper	0.023		0.036		0.044		0.036		0.028		0.030		0.033		0.023	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.330	53.327	53.327	53.327	53.315	53.315	53.327	53.327	53.327	53.327	53.327	53.327	53.315	53.315	53.315	53.315
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	53.404	53.391	53.404	53.391	53.391	53.401	53.391	53.396	53.391	53.393	53.414	53.414	53.386	53.386	53.404	53.404
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	6.63	7.01	6.55	6.76	6.81	6.88	6.58	6.68	6.73	6.76	6.60	6.96	6.45	6.86	6.53	6.73
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.030	0.038	0.038	0.041	0.033	0.036	0.041	0.043	0.038	0.041	0.036	0.038	0.041	0.043	0.036	0.041
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	338	347	351	338	338	343	347	343	338	347	338	338	343	347	347	343
Piston Avg. Diameter Middle & bottom of skirt	101.570		101.572		101.572		101.585		101.580		101.572		101.585		101.557	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	62.192	62.192	62.179	62.179	62.192	62.189	62.200	62.194	62.192	62.192
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	62.291	62.288	62.286	62.286	62.268	62.281	62.281	62.281	62.278	62.276

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		**Camshaft Lobe Lift**		**Piston Diameter**	101.519-101.646
Top	0.25-0.89	Intake	6.55-6.65	**Main Bearings**	
Bottom		Exhaust		Journal Diameter	62.177-62.212
				Shell Diameter	62.240-62.301
Cylinder Bore Diameter	101.587-101.664	**Valve Stem to Guide Clearance**			
Out-of-round	0.051	Intake	0.025-0.094		
Taper	0.025	Exhaust			
Connecting Rod Bearings		**Valve Spring Force**			
Journal Diameter	53.310-53.335	Intake	338-374 N-m @ 43.2 mm		
Shell Diameter	53.343-53.424	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
GRAND FORKS AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1735
TYPE OIL: BLUE (B)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.022		0.024		0.028		0.024		0.022		0.022		0.025		0.025	
Bottom	0.026		0.025		0.024		0.027		0.025		0.025		0.026		0.028	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	4.0013	4.0006	4.0015	4.0009	4.0018	4.0009	4.0017	4.0011	4.0015	4.0014	4.0013	4.0010	4.0010	4.0006	4.0013	4.0015
Middle	4.0006	4.0012	4.0002	4.0015	4.0004	4.0016	4.0010	4.0013	4.0010	4.0011	4.0005	4.0014	4.0002	4.0013	4.0012	4.0023
Bottom	4.0008	4.0014	4.0009	4.0013	4.0010	4.0015	4.0011	4.0016	4.0012	4.0011	4.0008	4.0012	4.0008	4.0011	4.0015	4.0024
Out-of-round	0.0007		0.0006		0.0009		0.0006		0.0001		0.0003		0.0004		0.0002	
Taper	0.0005		0.0006		0.0008		0.0006		0.0003		0.0005		0.0002		0.0002	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.0984	2.0989	2.0990	2.0986	2.0988	2.0989	2.0989	2.0989	2.0988	2.0990	2.0988	2.0988	2.0985	2.0985	2.0985	2.0986
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1018	2.1020	2.1014	2.1012	2.1015	2.1014	2.1016	2.1017	2.1020	2.1025	2.1008	2.1010	2.1012	2.1015	2.1018	2.1017
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.261	0.270	0.259	0.269	0.272	0.259	0.270	0.257	0.260	0.273	0.256	0.271	0.270	0.257	0.273	0.258
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0014	0.0015	0.0015	0.0016	0.0016	0.0015	0.0015	0.0014	0.0015	0.0016	0.0014	0.0014	0.0015	0.0016	0.0014	0.0015
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	78	75	75	74	78	75	78	76	72	74	78	76	74	75	76	73
Piston Avg. Diameter Middle & bottom of skirt	4.0002		3.9998		3.9989		3.9994		3.9999		4.0002		3.9998		3.9911	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4492	2.4489	2.4489	2.4488	2.4489	2.4488	2.4486	2.4484	2.4485	2.4482
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.4506	2.4506	2.4506	2.4505	2.4505	2.4505	2.4506	2.4506	2.4500	2.4500

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9968-4.0018
Top	0.010-0.035	Intake	0.258-0.262	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.4479-2.4493
Cylinder Bore Diameter	3.9995-4.0025	Valve Stem to Guide Clearance		Shell Diameter	2.4504-2.4528
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0988-2.0998	Intake	76-84 lb @ 1.70"		
Shell Diameter	2.1001-2.1033	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
GRAND FORKS AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 7981735
TYPE OIL: BLUE (B)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring																
Gaps																
Top	0.56*		0.61		0.71		0.61		0.56		0.56		0.64		0.64	
Bottom	0.66		0.64		0.61		0.69		0.64		0.64		0.66		0.71	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.633	101.615	101.638	101.623	101.646	101.623	101.643	101.628	101.638	101.636	101.633	101.625	101.625	101.615	101.633	101.638
Middle	101.615	101.630	101.605	101.638	101.610	101.641	101.625	101.633	101.625	101.628	101.613	101.636	101.605	101.633	101.630	101.658
Bottom	101.620	101.636	101.623	101.633	101.625	101.638	101.628	101.641	101.630	101.628	101.620	101.630	101.620	101.628	101.638	101.661
Out-of-round	0.018		0.015		0.023		0.015		0.002		0.008		0.010		0.005	
Taper	0.013		0.015		0.021		0.015		0.008		0.013		0.005		0.005	
Connecting Rod																
Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.299	53.312	53.315	53.304	53.310	53.312	53.312	53.312	53.310	53.315	53.310	53.310	53.302	53.302	53.302	53.304
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	53.386	53.391	53.376	53.370	53.378	53.376	53.381	53.383	53.391	53.404	53.360	53.365	53.370	53.378	53.386	53.383
Camshaft Lobe																
Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	6.63	6.86	6.58	6.83	6.91	6.58	6.86	6.53	6.60	6.93	6.50	6.88	6.86	6.53	6.93	0.655
Valve Stem to																
Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.036	0.038	0.039	0.041	0.041	0.038	0.038	0.036	0.038	0.041	0.036	0.036	0.038	0.041	0.036	0.038
Valve Spring																
Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	347	334	334	329	347	334	347	338	320	329	347	338	329	334	338	325
Piston Avg.Diameter																
Middle & bottom																
of skirt	101.615		101.595		101.572		101.585		101.575		101.615		101.595		101.374	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	62.210	62.202	62.202	62.200	62.202	62.200	62.194	62.189	62.192	62.184
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	62.245	62.245	62.245	62.243	62.243	62.243	62.245	62.245	62.230	62.230

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	101.519-101.646
Top	0.25-0.89	Intake	6.55-6.65	Main Bearings	
Bottom		Exhaust		Journal Diameter	62.177-62.212
				Shell Diameter	62.240-62.301
Cylinder Bore Diameter	101.587-101.664	Valve Stem to Guide Clearance			
Out-of-round	0.051	Intake	0.025-0.094		
Taper	0.025	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.310-53.335	Intake	338-374 N-m @ 43.2 mm		
Shell Diameter	53.343-53.424	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in N-m

ENGINE COMPONENTS MEASUREMENTS
HANCOCK AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B5038
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.063		0.021		0.048		0.024		0.054		0.066	
Bottom	0.035		0.029		0.030		0.031		0.038		0.039	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.4012	3.4017	3.4010	3.4009	3.4011	3.4019	3.4014	3.4016	3.4007	3.4017	3.4014	3.4017
Middle	3.4012	3.4021	3.4005	3.4006	3.4010	3.4023	3.4009	3.4019	3.4010	3.4023	3.4014	3.4021
Bottom	3.4014	3.4022	3.4007	3.4007	3.4012	3.4023	3.4011	3.4020	3.4011	3.4023	3.4016	3.4023
Out-of-round	0.0005		0.0001		0.0008		0.0002		0.0010		0.0003	
Taper	0.0002		0.0003		0.0001		0.0003		0.0004		0.0002	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1870	2.1869	2.1869	2.1869	2.1870	2.1870	2.1869	2.1869	2.1870	2.1870	2.1869	2.1869
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1892	2.1890	2.2136	2.2135	2.1892	2.1895	2.2130	2.2130	2.1890	2.1894	2.1906	2.1895
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.248	0.276	0.239	0.281	0.265	0.272	0.239	0.272	0.265	0.272	0.269	0.271
Valve Stem to Guide Clearance	No head on engine											
Valve Spring Force	No head on engine											
Piston Avg. Diameter												
Middle and bottom of skirt	3.3998		3.3996		3.4004		3.3997		3.3997		3.3998	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	2.7499	2.7499	2.7496	2.7498	2.7498	2.7499	2.7500	2.7500				
Shell Diameter	F	B	F	B	F	B	F	B				
	2.7518	2.7518	2.7512	2.7515	2.7512	2.7510	2.7515	2.7522				

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.3985-3.4015
Top	0.010-0.047	Intake	0.271	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.7495-2.7505
Cylinder Bore Diameter	3.4000-3.4020	Valve Stem to Guide Clearance		Shell Diameter	2.7500-2.7530
Out-of-round	0.005	Intake	0.001-0.017		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1865-2.1875	Intake	49-57 lbs. @ 1 11/16"		
Shell Diameter	2.1870-2.1900	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
HANCOCK AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B5038
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	1.60+		0.53		1.22		0.61		1.37		1.68	
Bottom	0.89		0.74		0.76		0.79		0.97		0.99	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	86.390	86.403	86.385	86.383	86.388	86.408	86.396	86.401	86.378	86.403	86.396	86.403
Middle	86.390	86.413	86.373	86.375	86.385	86.418	86.383	86.408	86.385	86.418	86.396	86.413
Bottom	86.396	86.416	86.378	86.378	86.390	86.418	86.388	86.411	86.388	86.418	86.401	86.418
Out-of-round	0.013		0.003		0.020		0.005		0.025		0.008	
Taper	0.005		0.008		0.003		0.008		0.010		0.005	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	55.550	55.547	55.547	55.547	55.550	55.550	55.547	55.547	55.550	55.547	55.547	55.547
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	55.606	55.601	55.625	55.223	55.606	55.613	56.210	56.210	55.601	55.611	55.641	55.613
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.30	7.01	6.07	7.14	6.73	6.91	6.07	6.91	6.73	6.91	6.83	6.88
Valve Stem to Guide Clearance	No head on engine											
Valve Spring Force@	No head on engine											
Piston Avg. Diameter												
Middle and bottom of skirt	86.355		86.350		86.370		86.352		86.352		86.355	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	69.847	69.847	69.840	69.845	69.845	69.847	69.850	69.850				
Shell Diameter	F	B	F	B	F	B	F	B				
	69.896	69.896	69.880	69.888	69.880	69.875	69.888	69.906				

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	86.322-86.398
Top	0.25-1.19	Intake	6.88	Main Bearings	
Bottom		Exhaust		Journal Diameter	69.837-69.863
Cylinder Bore Diameter	86.360-86.411	Valve Stem to Guide Clearance		Shell Diameter	69.850-69.926
Out-of-round	0.13	Intake	0.025-0.43		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	55.537-55.563	Intake	218-254 N-m @ 42.86 mm		
Shell Diameter	55.550-55.626	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
HANCOCK AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 78B5646
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.024		0.026		0.027		0.024		0.027		0.028	
Bottom	0.029		0.028		0.024		0.029		0.026		0.022	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	4.0024	4.0017	4.0028	4.0020	4.0036	4.0028	4.0031	4.0022	4.0014	4.0027	4.0032	4.0026
Middle	4.0017	4.0020	4.0020	4.0028	4.0013	4.0024	4.0019	4.0027	4.0017	4.0010	4.0018	4.0027
Bottom	4.0020	4.0026	4.0025	4.0030	4.0013	4.0024	4.0021	4.0021	4.0013	4.0011	4.0020	4.0035
Out-of-round	0.0007		0.0008		0.0008		0.0009		0.0013		0.0006	
Taper	0.0004		0.0002		0.0023		0.0010		0.0001		0.0012	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1223	2.1223	2.1222	2.1222	2.1223	2.1223	2.1222	2.1222	2.1223	2.1223	2.1223	2.1223
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1265	2.1265	2.1271	2.1272	2.1270	2.1270	2.1266	2.1266	2.1267	2.1267	2.1266	2.1266
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.242	0.230	0.238	0.242	0.225	0.244	0.221	0.218	0.231	0.237	0.235	0.233
Valve Stem to Guide Clearance	No head on engine											
Valve Spring Force	No head on engine											
Piston Avg. Diameter												
Middle and bottom of skirt	3.9992		3.9995		3.9990		3.9991		3.9990		3.9995	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984	2.3984
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.4019	2.4019	2.4018	2.4018	2.4019	2.4019	2.4018	2.4018	2.4018	2.4018	2.4018	2.4018	2.4019	2.4019

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9946-4.0002
Top	0.010-0.020	Intake	0.244-0.249	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	4.0000-4.0048	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4014
Out-of-round	0.005	Intake	0.0010-0.0055		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1228-2.1236	Intake	68.4-84 lbs. @ 1.7"		
Shell Diameter	2.1235-2.1260	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
HANCOCK AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 78B5646
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.61*		0.66		0.69		0.61		0.69		0.71	
Bottom	0.74		0.71		0.61		0.74		0.66		0.56	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.661	101.643	101.671	101.651	101.691	101.671	101.679	101.656	101.636	101.669	101.681	101.666
Middle	101.643	101.651	101.651	101.671	101.633	101.661	101.648	101.669	101.643	101.625	101.646	101.669
Bottom	101.651	101.666	101.664	101.676	101.633	101.661	101.653	101.653	101.633	101.628	101.651	101.689
Out-of-round	0.018		0.020		0.058		0.023		0.033		0.015	
Taper	0.010		0.008		0.058		0.025		0.003		0.030	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.906	53.906	53.904	53.904	53.906	53.906	53.904	53.904	53.906	53.906	53.906	53.906
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	54.013	54.013	54.029	54.031	54.026	54.026	54.016	54.016	54.018	54.018	54.016	54.016
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.15	5.84	6.05	6.15	5.72	6.20	5.61	5.54	5.87	6.02	5.97	5.92
Valve Stem to Guide Clearance	No head on engine											
Valve Spring Force@	No head on engine											
Piston Avg. Diameter												
Middle and bottom of skirt	101.580		101.587		101.575		101.577		101.575		101.587	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919	60.919
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	61.008	61.008	61.006	61.006	61.008	61.008	61.006	61.006	61.006	61.006	61.006	61.008	61.008	61.008

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	101.463-101.605
Top	0.25-0.51	Intake	6.20-6.32	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	101.600-101.722	Valve Stem to Guide Clearance		Shell Diameter	60.935-60.996
Out-of-round	0.13	Intake	0.025-0.140		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.919-53.939	Intake	304-374 N-m @ 43.2 mm		
Shell Diameter	53.937-54.000	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2270
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.055		0.045		0.035		0.037		0.040		0.050	
Bottom	0.044		0.037		0.037		0.037		0.042		0.050	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	4.0049	4.0050	4.0026	4.0025	4.0029	4.0021	4.0020	4.0018	4.0018	4.0019	4.0039	4.0055
Middle	4.0021	4.0033	4.0009	4.0022	4.0009	4.0022	4.0002	4.0016	4.0007	4.0020	4.0007	4.0015
Bottom	4.0014	4.0020	4.0007	4.0012	4.0010	4.0011	4.0003	4.0008	4.0001	4.0008	4.0002	4.0015
Out-of-round	0.0001		0.0001		0.0008		0.0002		0.0001		0.0016	
Taper	0.0035		0.0019		0.0019		0.0017		0.0017		0.0037	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1242	2.1242	2.1225	2.1225	2.1225	2.1225	2.1225	2.1226	2.1225	2.1228	2.1226	2.1226
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1255	2.1255	2.1254	2.1250	2.1253	2.1256	2.1252	2.1258	2.1255	2.1252	2.1250	2.1252
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.250	0.247	0.245	0.248	0.249	0.248	0.251	0.252	0.237	0.245	0.251	0.238
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0019	0.0017	0.0016	0.0017	0.0017	0.0018	0.0017	0.0018	0.0017	0.0017	0.0018	0.0017
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	80	79	80	80	79	79	80	80	80	79	79	80
Piston Avg. Diameter												
Middle and bottom of skirt	3.9991		3.9989		3.9996		3.9986		3.9982		3.9992	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.3984	2.3984	2.3980	2.3980	2.3986	2.3986	2.3984	2.3984	2.3980	2.3980	2.3982	2.3983	2.3986	2.3985
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.3999	2.3999	2.4000	2.3998	2.4007	2.4002	2.4001	2.4004	2.4009	2.4003	2.4007	2.4004	2.4005	2.4002

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9946-4.0002
Top	0.010-0.020	Intake	0.244-0.249	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	4.0000-4.0048	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4014
Out-of-round	0.005	Intake	0.0010-0.0055		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1228-2.1236	Intake	68.4-84 lbs. @ 1.7"		
Shell Diameter	2.1235-2.1260	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2270
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	1.40+		1.14		0.89		0.94		1.02		1.27	
Bottom	1.12		0.94		0.94		0.94		1.07		1.27	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.724	101.727	101.666	101.664	101.674	101.653	101.651	101.646	101.646	101.648	101.699	101.740
Middle	101.653	101.684	101.623	101.656	101.623	101.656	101.605	101.641	101.618	101.651	101.618	101.638
Bottom	101.636	101.651	101.618	101.630	101.625	101.628	101.608	101.620	101.603	101.620	101.635	101.638
Out-of-round	0.003		0.003		0.020		0.005		0.003		0.041	
Taper	0.089		0.048		0.048		0.043		0.043		0.094	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.955	53.955	53.912	53.912	53.912	53.912	53.912	53.914	53.912	53.919	53.914	53.914
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.988	53.988	53.985	53.975	53.983	53.990	53.980	53.995	53.988	53.980	53.975	53.980
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.35	6.27	6.22	6.30	6.32	6.30	6.38	6.40	6.02	6.22	6.38	6.05
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.048	0.043	0.041	0.043	0.043	0.046	0.043	0.046	0.043	0.043	0.046	0.043
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	356	351	356	356	351	351	356	356	356	351	351	356
Piston Avg. Diameter												
Middle and bottom of skirt	101.577		101.572		101.590		101.564		101.554		101.580	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	60.919	60.919	60.909	60.909	60.924	60.924	60.919	60.919	60.909	60.909	60.914	60.917	60.924	60.922
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	60.957	60.957	60.960	60.955	60.978	60.965	60.963	60.970	60.983	60.968	60.963	60.970	60.973	60.965

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		*Piston Diameter*	101.463-101.605
Top	0.25-0.51	Intake	6.20-632	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	101.600-101.722	Valve Stem to Guide Clearance		Shell Diameter	60.935-60.996
Out-of-round	0.13	*Intake*	0.025-0.140		
Taper	0.25	Exhaust			
Connecting Rod Bearings		*Valve Spring Force*			
Journal Diameter	53.919-53.939	Intake	304-374 (N-m) @ 43.2 mm		
Shell Diameter	53.937-54.000	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2271
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.067		0.055		0.060		0.058		0.073		0.090	
Bottom	0.055		0.069		0.045		0.059		0.079		0.079	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	4.0033	4.0045	4.0030	4.0040	4.0022	4.0034	4.0036	4.0040	4.0039	4.0034	3.9985	3.9986
Middle	4.0017	4.0025	4.0022	4.0030	4.0013	4.0022	4.0021	4.0027	4.0027	4.0034	4.0049	4.0053
Bottom	4.0005	4.0011	4.0013	4.0012	4.0007	4.0010	4.0013	4.0015	4.0008	4.0013	4.0015	4.0026
Out-of-round	0.0012		0.0010		0.0012		0.0004		0.0005		0.0001	
Taper	0.0028		0.0017		0.0015		0.0023		0.0031		0.0030	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1222	2.1222	2.1228	2.1229	2.1224	2.1222	2.1224	2.1224	2.1221	2.1221	2.1227	2.1228
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1260	2.1253	2.1255	2.1254	2.1253	2.1253	2.1255	2.1254	2.1251	2.1253	2.1252	2.1252
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.246	0.246	0.244	0.246	0.246	0.246	0.248	0.240	0.243	0.246	0.248	0.245
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0024	0.0022	0.0020	0.0022	0.0017	0.0019	0.0022	0.0021	0.0019	0.0021	0.0019	0.0020
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	78	81	80	79	78	80	79	78	80	79	81	81
Piston Avg. Diameter												
Middle and bottom of skirt	3.9997		4.0001		3.9991		3.9999		3.9998		4.0012	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.3986	2.3987	2.3982	2.3982	2.3988	2.3984	2.3985	2.3985	2.3980	2.3980	2.3980	2.3980	2.3982	2.3982
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.4008	2.4002	2.4009	2.4005	2.4009	2.4009	2.4003	2.4006	2.4001	2.4004	2.4003	2.4009	2.4009	2.4008

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9946-4.0002
Top	0.010-0.020	Intake	0.244-0.249	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	4.0000-4.0048	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4014
Out-of-round	0.005	Intake	0.0010-0.0055		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1228-2.1236	Intake	68.4-84 lbs. @ 1.7"		
Shell Diameter	2.1235-2.1260	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2271
TYPE OIL: GREEN

Component	Cylinder No. 1	2	3	4	5	6
Compression Ring Gaps						
Top	1.70*	1.40	1.52	1.47	1.85	2.29
Bottom	1.40	1.75	1.14	1.50	2.01	2.01
Cylinder Bore Diameter	L / T	L / T	L / T	L / T	L / T	L / T
Top	101.684 / 101.714	101.676 / 101.702	101.656 / 101.686	101.691 / 101.702	101.699 / 101.686	101.562 / 101.564
Middle	101.643 / 101.664	101.656 / 101.676	101.633 / 101.656	101.653 / 101.669	101.669 / 101.686	101.724 / 101.735
Bottom	101.613 / 101.628	101.633 / 101.630	101.618 / 101.625	101.633 / 101.638	101.620 / 101.633	101.638 / 101.666
Out-of-round	0.030	0.026	0.030	0.011	0.013	0.002
Taper	0.071	0.043	0.038	0.058	0.079	0.076
Connecting Rod Bearings						
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V
Shell Diameter	53.904 / 53.904	53.919 / 53.922	53.909 / 53.904	53.909 / 53.909	53.901 / 53.901	53.917 / 53.919
	F / B	F / B	F / B	F / B	F / B	F / B
	54.000 / 53.983	53.988 / 53.985	53.983 / 53.983	53.988 / 53.985	53.987 / 53.983	53.980 / 53.980
Camshaft Lobe Lift	I / E	I / E	I / E	I / E	I / E	I / E
	6.25 / 6.25	6.20 / 6.25	6.25 / 6.25	6.30 / 6.10	6.17 / 6.25	6.30 / 6.22
Valve Stem to Guide Clearance	I / E	I / E	I / E	I / E	I / E	I / E
	0.061 / 0.056	0.051 / 0.056	0.043 / 0.048	0.056 / 0.053	0.048 / 0.053	0.048 / 0.051
Valve Spring Force[@]	I / E	I / E	I / E	I / E	I / E	I / E
	347 / 360	356 / 351	347 / 356	351 / 347	356 / 351	360 / 360
Piston Avg. Diameter						
Middle and bottom of skirt	101.592	101.603	101.577	101.597	101.595	101.630

Main Bearings	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V	H / V
Shell Diameter	60.924 / 60.927	60.914 / 60.914	60.930 / 60.919	60.922 / 60.922	60.909 / 60.909	60.909 / 60.909	60.914 / 60.914
	F / B	F / B	F / B	F / B	F / B	F / B	F / B
	60.980 / 60.965	60.983 / 60.973	60.983 / 60.983	60.968 / 60.975	60.963 / 60.970	60.968 / 60.983	60.983 / 60.980

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	101.463-101.605
Top	0.25-0.51	Intake	6.20-632	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	101.600-101.722	Valve Stem to Guide Clearance		Shell Diameter	60.935-60.996
Out-of-round	0.13	Intake	0.025-0.140		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.919-53.939	Intake	304-374 (N-m) @ 43.2 mm		
Shell Diameter	53.937-54.000	Exhaust			

@L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2272
TYPE OIL: BLUE (A)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.035		0.028		0.032		0.029		0.030		0.034	
Bottom	0.035		0.030		0.028		0.030		0.032		0.032	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	4.0026	4.0019	4.0026	4.0020	4.0027	4.0023	4.0022	4.0013	4.0025	4.0024	4.0021	4.0028
Middle	4.0010	4.0019	4.0010	4.0017	4.0010	4.0021	4.0015	4.0022	4.0014	4.0013	4.0012	4.0030
Bottom	4.0012	4.0015	4.0014	4.0012	4.0012	4.0013	4.0013	4.0010	4.0014	4.0013	4.0008	4.0024
Out-of-round	0.0007		0.0006		0.0004		0.0009		0.0001		0.0007	
Taper	0.0014		0.0012		0.0015		0.0009		0.0011		0.0013	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
Shell Diameter	2.1231	2.1229	2.1232	2.1232	2.1228	2.1228	2.1232	2.1231	2.1229	2.1228	2.1233	2.1235
	F	B	F	B	F	B	F	B	F	B	F	B
	2.1256	2.1255	2.1258	2.1255	2.1252	2.1253	2.1256	2.1255	2.1250	2.1250	2.1255	2.1250
Camshaft Lobe Lift	Not measured											
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0017	0.0014	0.0014	0.0015	0.0014	0.0016	0.0016	0.0017	0.0015	0.0014	0.0016	0.0013
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	80	80	80	79	79	78	80	80	79	80	80	79
Piston Avg. Diameter												
Middle and bottom of skirt	3.9987		3.9999		3.9999		3.9996		3.9993		3.9992	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.3986	2.3988	2.3986	2.3984	2.3985	2.3984	2.3983	2.3984	2.3988	2.3986	2.3986	2.3983	2.3987	2.3987
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.4011	2.4010	2.4010	2.4008	2.4010	2.4010	2.4011	2.4010	2.4010	2.4010	2.4008	2.4009	2.4010	2.4010

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9946-4.0002
Top	0.010-0.020	Intake	0.244-0.249	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	4.0000-4.0048	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4014
Out-of-round	0.005	Intake	0.0010-0.0055		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1228-2.1236	Intake	68.4-84 lbs. @ 1.7"		
Shell Diameter	2.1235-2.1260	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
LACKLAND AIR FORCE BASE
ENGINE TYPE: FORD, 6 CYLINDER, 300 CID
VEHICLE NO. 79B2272
TYPE OIL: BLUE (A)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.89+		0.71		0.81		0.74		0.76		0.86	
Bottom	0.89		0.76		0.71		0.76		0.91		0.81	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.666	101.648	101.666	101.651	101.669	101.658	101.656	101.633	101.644	101.661	101.653	101.671
Middle	101.625	101.648	101.625	101.643	101.625	101.653	101.638	101.656	101.636	101.633	101.630	101.676
Bottom	101.630	101.638	101.636	101.630	101.630	101.633	101.633	101.625	101.636	101.633	101.620	101.661
Out-of-round	0.018		0.015		0.011		0.023		0.003		0.018	
Taper	0.036		0.030		0.039		0.023		0.028		0.033	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.927	53.922	53.929	53.929	53.919	53.919	53.929	53.929	53.922	53.919	53.932	53.937
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.990	53.988	53.995	53.988	53.980	53.983	53.990	53.988	53.975	53.975	53.988	53.975
Camshaft Lobe Lift	Not measured											
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.043	0.036	0.036	0.038	0.036	0.041	0.041	0.043	0.038	0.036	0.041	0.033
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	356	356	356	351	351	347	356	356	351	356	356	351
Piston Avg. Diameter												
Middle and bottom of skirt	101.567		101.575		101.597		101.590		101.582		101.580	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	60.924	60.930	60.924	60.919	60.922	60.920	60.917	60.919	60.930	60.924	60.924	60.917	60.927	60.927
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	60.988	60.985	60.985	60.980	60.985	60.985	60.988	60.985	60.985	60.985	60.980	60.983	60.985	60.985

Manufacturers Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	101.463-101.605
Top	0.25-0.51	Intake	6.20-632	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	101.600-101.722	Valve Stem to Guide Clearance		Shell Diameter	60.935-60.996
Out-of-round	0.13	Intake	0.025-0.140		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.919-53.939	Intake	304-374 (N-m) @ 43.2 mm		
Shell Diameter	53.937-54.000	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
MINOT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1736
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.024		0.022		0.022		0.024		0.021		No rings		0.026		No rings	
Bottom	0.022		0.030		0.022		0.030		0.022		No rings		0.020		No rings	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	4.0027	4.0018	4.0024	4.0018	4.0020	4.0006	4.0019	4.0017	4.0034	4.0020	4.0018	4.0020	4.0015	4.0015	4.0021	4.0014
Middle	4.0005	4.0012	4.0000	4.0011	4.0000	4.0005	4.0004	4.0011	4.0003	4.0005	4.0002	4.0011	4.0005	4.0015	4.0003	4.0008
Bottom	4.0009	4.0014	4.0005	4.0006	4.0003	4.0006	4.0008	4.0015	4.0008	4.0008	4.0007	4.0009	4.0012	4.0012	4.0008	4.0013
Out-of-round	0.0009		0.0006		0.0014		0.0002		0.0014		0.0002		0.0000		0.0007	
Taper	0.0018		0.0019		0.0017		0.0011		0.0026		0.0011		0.0003		0.0013	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.0992	2.0989	2.0992	2.0995	2.0994	2.0990	2.0990	2.0990	2.0988	2.0984	2.0988	2.0988	2.0988	2.0984	2.0985	2.0982
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.1018	2.1025	2.1020	2.1020	2.1020	2.1020	2.1018	2.1025	2.1027	2.1029	2.1018	2.1019	2.1025	2.1025	2.1022	2.1020
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.259	0.270	0.259	0.269	0.270	0.261	0.270	0.258	0.270	0.272	0.267	0.276	0.267	0.260	0.273	0.026
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0012	0.0015	0.0014	0.0013	0.0015	0.0015	0.0015	0.0014	0.0013	0.0014	0.0015	0.0016	0.0014	0.0013	0.0014	0.0014
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	74	71	75	78	75	73	77	76	77	77	74	76	74	75	75	75
Piston Avg. Diameter Middle & bottom of skirt	4.0001		3.9980		3.9995		3.9986		3.9992		3.9995		3.9985		3.9995	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4488	2.4482	2.4488	2.4486	2.4488	2.4488	2.4488	2.4488	2.4484	2.4485
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.4510	2.4515	2.4510	2.4514	2.4515	2.4515	2.4514	2.4515	2.4518	2.4515

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.9968-4.0018
Top	0.010-0.035	Intake	0.258-0.262	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.4479-2.4493
				Shell Diameter	2.4504-2.4528
Cylinder Bore Diameter	3.9995-4.0025	Valve Stem to Guide Clearance			
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0988-2.0998	Intake	78-84 lb @ 170"		
Shell Diameter	2.1001-2.1033	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
MINOT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1736
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression R.. ,																
Gaps																
Top	0.61*		0.56		0.56		0.61		0.53		No rings		0.66		No rings	
Bottom	0.56		0.76		0.56		0.76		0.56		No rings		0.51		No rings	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.669	101.646	101.661	101.646	101.651	101.615	101.648	101.643	101.686	101.651	101.646	101.651	101.638	101.638	101.653	101.636
Middle	101.613	101.630	101.600	101.628	101.600	101.613	101.610	101.628	101.608	101.613	101.605	101.628	101.613	101.638	101.608	101.620
Bottom	101.623	101.636	101.613	101.615	101.608	101.615	101.620	101.638	101.620	101.620	101.618	101.623	101.630	101.630	101.620	101.633
Out-of-round	0.023		0.015		0.036		0.005		0.035		0.005		0.000		0.017	
Taper	0.046		0.048		0.043		0.028		0.066		0.028		0.008		0.033	
Connecting Rod																
Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.320	53.312	53.320	53.327	53.325	53.315	53.315	53.315	53.310	53.299	53.310	53.310	53.310	53.299	53.302	53.294
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	53.386	53.404	53.391	53.391	53.391	53.391	53.386	53.404	53.409	53.414	53.386	53.388	53.404	53.404	53.396	53.391
Camshaft Lobe																
Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	6.58	6.86	6.58	6.83	6.86	6.63	6.86	6.55	6.35	6.19	6.78	7.01	6.78	6.60	6.93	0.66
Valve Stem to																
Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.030	0.038	0.036	0.033	0.038	0.038	0.038	0.036	0.033	0.036	0.038	0.041	0.036	0.033	0.036	0.036
Valve Spring																
Force@	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	329	316	334	347	334	325	343	338	343	343	329	338	329	334	334	334
Piston Avg.Diameter																
Middle & bottom																
of skirt	101.603		101.549		101.587		101.564		101.580		101.587		101.562		101.587	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	62.200	62.184	62.200	62.194	62.200	62.200	62.200	62.200	62.200	62.192
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	62.255	62.268	62.255	62.266	62.268	62.268	62.266	62.268	62.276	62.268

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	101.519-101.646
Top	0.25-0.89	Intake	6.55-6.65	Main Bearings	
Bottom		Exhaust		Journal Diameter	62.177-62.212
				Shell Diameter	62.240-62.301
Cylinder Bore Diameter	101.587-101.664	Valve Stem to Guide Clearance			
Out-of-round	0.051	Intake	0.025-0.094		
Taper	0.025	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.310-53.335	Intake	347-374 N-m @ 43.7 mm		
Shell Diameter	53.343-53.424	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
MINOT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1759
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.029		0.031		0.030		0.030		0.028		0.036		0.028		0.030	
Bottom	0.028		0.028		0.026		0.028		0.025		0.028		0.022		0.030	
Cylinder Bore																
Diameter	L*	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	4.0023	4.0018	4.0025	4.0018	4.0016	4.0013	4.0025	4.0021	4.0024	4.0018	4.0021	4.0012	4.0012	4.0010	4.0010	4.0011
Middle	4.0007	4.0013	4.0003	4.0013	3.9998	4.0010	4.0006	4.0015	4.0013	4.0013	3.9999	4.0008	4.0014	4.0014	3.9998	4.0006
Bottom	4.0006	4.0014	4.0007	4.0013	4.0003	4.0009	4.0004	4.0015	4.0018	4.0014	4.0005	4.0008	4.0009	4.0014	4.0004	4.0008
Out-of-round	0.0005		0.0007		0.0003		0.0004		0.0006		0.0009		0.0002		0.0001	
Taper	0.0017		0.0018		0.0013		0.0021		0.0006		0.0016		0.0003		0.0006	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.0978	2.0980	2.0975	2.0978	2.0980	2.0981	2.0982	2.0979	2.0980	2.0978	2.0980	2.0978	2.0985	2.0985	2.0985	2.0985
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.0995	2.0999	2.1003	2.1015	2.1005	2.1002	2.0999	2.1002	2.1005	2.1009	2.1010	2.1012	2.1005	2.1006	2.1004	2.1008
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.258	0.271	0.070	0.271	0.271	0.259	0.268	0.260	0.260	0.276	0.258	0.270	0.268	0.264	0.273	0.249
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.0020	0.0019	0.0019	0.0021	0.0019	0.0018	0.0017	0.0019	0.0017	0.0016	0.0017	0.0017	0.0020	0.0019	0.0019	0.0020
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	71	71	73	72	73	72	73	73	72	71	73	72	72	74	73	74
Piston Avg. Diameter Middle & bottom of skirt	4.0003		4.0003		3.9991		3.9995		3.9990		4.0000		3.9998		3.9942	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5	
Journal Diameter	H	V	H	V	H	V	H	V	H	V
	2.4402	2.4402	2.4400	2.4400	2.4400	2.4400	2.4400	2.4402	2.4398	2.4399
Shell Diameter	F	B	F	B	F	B	F	B	F	B
	2.4435	2.4430	2.4430	2.4432	2.4429	2.4430	2.4428	2.4430	2.4432	2.4430

Manufacturer's Service Limits, Inches

Compression Ring Gaps
- Top: 0.010-0.035
- Bottom

Cylinder Bore
- Diameter: 3.9995-4.0025
- Out-of-round: 0.002
- Taper: 0.001

Connecting Rod Bearings
- Journal Diameter: 2.0988-2.0998
- Shell Diameter: 2.1001-2.1033

Camshaft Lobe Lift
- Intake: 0.258-0.262
- Exhaust

Valve Stem to Guide Clearance
- Intake: 0.0010-0.0037
- Exhaust

Valve Spring Force
- Intake: 76-84 lb @ 1.70"
- Exhaust

Piston Diameter: 3.9968-4.0018

Main Bearings
- Journal Diameter: 2.4479-2.4493
- Shell Diameter: 2.4504-2.4528

ENGINE COMPONENTS MEASUREMENTS
MINOT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, V-8, 350 CID
VEHICLE NO. 79B1759
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6		7		8	
Compression Ring Gaps																
Top	0.74+		0.79		0.76		0.76		0.71		0.91		0.71		0.76	
Bottom	0.71		0.71		0.66		0.71		0.64		0.71		0.56		0.76	
Cylinder Bore																
Diameter	L	T	L	T	L	T	L	T	L	T	L	T	L	T	L	T
Top	101.658	101.646	101.664	101.646	101.641	101.633	101.663	101.653	101.661	101.646	101.653	101.630	101.630	101.625	101.625	101.628
Middle	101.618	101.633	101.608	101.633	101.595	101.625	101.615	101 638	101.638	101.633	101.597	101.620	101.610	101.636	101.595	101.615
Bottom	101.615	101.636	101.618	101.633	101.608	101.623	101.610	101.638	101.646	101.636	101.613	101.620	101.623	101.636	101.610	101.620
Out-of-round	0.012		0.018		0.008		0.010		0.015		0.023		0.005		0.003	
Taper	0.043		0.046		0.033		0.053		0.015		0.040		0.007		0.015	
Connecting Rod Bearings																
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	53.284	53.289	53.277	53.284	53.289	53.292	53.294	53.287	53.289	53.284	53.289	53.284	53.302	53.302	53.302	53.302
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	53.327	53.337	53.348	53.378	53.353	53.345	53.337	53.345	53.353	53.363	53.365	53.370	53.353	53.355	53.350	53.360
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	6.55	6.88	1.78	6.88	6.88	6.58	6.81	6.60	6.60	7.01	6.55	6.86	6.81	6.71	6.93	6.3?
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	0.051	0.048	0.048	0.053	0.048	0.046	0.043	0.048	0.043	0.041	0.043	0.043	0.051	0.048	0.048	0.051
Valve Spring Force°	I	E	I	E	I	E	I	E	I	E	I	E	I	E	I	E
	316	316	325	320	325	320	325	325	320	316	325	320	320	329	325	329
Piston Avg.Diameter Middle & bottom of skirt	101.608		101.608		101.577		101.587		101.575		101.600		101.595		101.453	
Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5							
Journal Diameter	H	V	H	V	H	V	H	V	H	V						
	61.981	61.981	61.976	61.976	61.976	61.976	61.976	61.981	61.971	61.973						
Shell Diameter	F	B	F	B	F	B	F	B	F	B						
	62.065	62.0 2	62.052	62.057	62.050	62.052	62.047	62.052	62.057	62.052						

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		*Camshaft Lobe Lift*		*Piston Diameter*	101.519-101.646
Top	0.25-0.89	Intake	6.55-6.65	Main Bearings	
Bottom		Exhaust		Journal Diameter	62.177-62.212
Cylinder Bore Diameter	101.587-101.664	Valve Stem to Guide Clearance		Shell Diameter	62.240-62.301
Out-of-round	0.051	Intake	0.025-0.094		
Taper	0.025	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.310-53.335	Intake	338-374 N-m @ 43.2 mm		
Shell Diameter	53.343-53.424	Exhaust			

°L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
° = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 79B5212
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.098		0.089		0.094		0.099		0.096		0.105	
Bottom	0.049		0.056		0.087		0.058		0.047		0.090	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.4008	3.4015	3.4006	3.4020	3.4009	3.4017	3.4012	3.4017	3.4015	3.4015	3.4014	3.4019
Middle	3.4009	3.4015	3.4005	3.4030	3.4020	3.4039	3.4017	3.4029	3.4013	3.4028	3.4011	3.4026
Bottom	3.4010	3.4016	3.4007	3.4032	3.4018	3.4031	3.4018	3.4026	3.4014	3.4031	3.4014	3.4029
Out-of-round	0.0007		0.0014		0.0008		0.0005		0.0000		0.0005	
Taper	0.0002		0.0001		0.0009		0.0006		0.0001		0.0000	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1863	2.1863	2.1865	2.1865	2.1865	2.1865	2.1864	2.1864	2.1865	2.1865	2.1865	2.1865
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1902	2.1902	2.1901	2.1901	2.1902	2.1902	2.1900	2.1900	2.1901	2.1901	2.1903	2.1903
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.266	0.273	0.271	0.276	0.271	0.274	0.270	0.275	0.270	0.255	0.265	0.274
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0022	0.0009	0.0023	0.0021	0.0029	0.0011	0.0024	0.0021	0.0020	0.0018	0.0018	0.0020
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	52	50	51	54	49	52	51	50	53	52	50	50
Piston Avg. Diameter												
Middle and bottom and skirt	3.3998		3.3990		3.3988		3.3989		3.3984		3.3988	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	2.7498	2.7498	2.7499	2.7499	2.7498	2.7498	2.7499	2.7499				
Shell Diameter	F	B	F	B	F	B	F	B				
	2.7530	2.7530	2.7525	2.7525	2.7532	2.7532	2.7528	2.7528				

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.3985-3.4015
Top	0.010-0.047	Intake	0.271	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.7495-2.7505
Cylinder Bore Diameter	3.4000-3.4020	Valve Stem to Guide Clearance		Shell Diameter	2.7500-2.7530
Out-of-round	0.005	Intake	0.0010-0.0170		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1865-2.1875	Intake	49-57 lbs @ 1 11/16" (closed); 137-150 lbs @ 1 5/16" (open)		
Shell Diameter	2.1870-2.1900	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 79B5212
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	2.49+		2.26		2.39		2.51		2.44		2.67	
Bottom	1.24		1.42		2.21		1.47		1.19		2.29	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	86.380	86.398	86.375	86.411	86.383	86.403	86.390	86.403	86.398	86.398	86.396	86.408
Middle	86.383	86.398	86.373	86.436	86.411	86.459	86.403	86.434	86.393	86.341	86.388	86.426
Bottom	86.385	86.401	86.378	86.411	86.406	86.439	86.406	86.426	86.396	86.439	86.396	86.434
Out-of-round	0.018		0.036		0.020		0.013		0.000		0.012	
Taper	0.005		0.003		0.023		0.016		0.002		0.000	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	55.532	55.532	55.537	55.537	55.537	55.537	55.535	55.535	55.537	55.537	55.537	55.537
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	55.631	55.631	55.629	55.629	55.631	55.631	55.626	55.626	55.629	55.629	55.634	55.634
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.76	6.93	6.88	7.01	6.88	6.96	6.86	6.99	6.86	6.48	6.73	6.96
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.056	0.023	0.058	0.053	0.074	0.029	0.061	0.053	0.051	0.046	0.046	0.051
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	231	222	227	240	218	231	227	222	236	231	222	222
Piston Avg. Diameter												
Middle and bottom of skirt	86.355		86.335		86.330		86.332		86.319		86.330	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	69.845	69.845	69.847	69.847	69.845	69.845	69.847	69.847				
Shell Diameter	F	B	F	B	F	B	F	B				
	69.926	69.926	69.914	69.914	69.931	69.931	69.921	69.921				

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	86.322-86.398
Top	0.25-1.19	Intake	6.88	Main Bearings	
Bottom		Exhaust		*Journal Diameter*	69.837-69.863
Cylinder Bore Diameter	86.360-86.411	Valve Stem to Guide Clearance		Shell Diameter	69.850-69.926
Out-of-round	0.13	Intake	0.03-0.43		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	55.537-55.563	Intake	218-254 N-m @ 42.86 mm (closed); 609-667 N-m @ 33.3 mm (open)		
Shell Diameter	55.550-55.626	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B9187
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.099		0.092		0.104		0.109		0.098		0.097	
Bottom	0.088		0.049		0.082		0.076		0.087		0.087	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.4018	3.4020	3.4014	3.4019	3.4018	3.4019	3.4021	3.4020	3.4008	3.4017	3.4021	3.4026
Middle	3.4013	3.4019	3.4009	4.4020	3.4012	3.4023	3.4011	3.4021	3.4009	3.4017	3.4019	3.4022
Bottom	3.4014	3.4022	3.4011	3.4020	3.4015	3.4024	3.4014	3.4020	3.4013	3.4019	3.4021	3.4022
Out-of-round	0.0002		0.0005		0.0001		0.0001		0.0009		0.0005	
Taper	0.0003		0.0003		0.0003		0.0007		0.0005		0.0000	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1861	2.1862	2.1865	2.1865	2.1863	2.1863	2.1865	2.1865	2.1865	2.1865	2.1866	2.1866
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1905	2.1905	2.1904	2.1903	2.1905	2.1905	2.1903	2.1903	2.1903	2.1903	2.1904	2.1904
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.271	0.275	0.261	0.272	0.261	0.269	0.268	0.265	0.272	0.266	0.268	0.265
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0025	0.0033	0.0021	0.0040	0.0018	0.0047	0.0023	0.0042	0.0030	0.0042	0.0019	0.0045
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	52	49	48	49	52	54	54	53	50	50	52	51
Piston Avg. Diameter												
Middle and bottom of skirt	3.3992		3.3995		3.3996		3.3989		3.3987		3.3989	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	2.7500	2.7500	2.7500	2.7500	2.7500	2.7500	2.7500	2.7500				
Shell Diameter	F	B	F	B	F	B	F	B				
	2.7530	2.7530	2.7528	2.7528	2.7530	2.7530	2.7529	2.7529				

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.3985-3.4015
Top	0.010-0.047	Intake	0.271	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.7495-2.7505
Cylinder Bore Diameter	3.4000-3.4020	Valve Stem to Guide Clearance		Shell Diameter	2.7500-2.7530
Out-of-round	0.005	Intake	0.001-0.013		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1865-2.1875	Intake	49-57 lbs @ 1 11/16" (closed); 137-152 lbs @ 1 5/16" (open)		
Shell Diameter	2.1870-2.1900	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B9187
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	2.51+		2.34		2.64		2.77		2.49		2.46	
Bottom	2.24		1.24		2.08		1.93		2.21		2.21	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	86.406	86.411	86.396	86.408	86.406	86.408	86.413	86.411	86.380	86.403	86.413	86.426
Middle	86.393	86.408	86.383	86.411	86.390	86.418	86.387	86.413	86.383	86.403	86.408	86.416
Bottom	86.396	86.416	86.387	86.411	86.398	86.421	86.396	86.411	86.393	86.408	86.413	86.416
Out-of-round	0.005		0.012		0.002		0.002		0.023		0.013	
Taper	0.010		0.004		0.008		0.017		0.013		0.000	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	55.527	55.529	55.537	55.537	55.532	55.532	55.537	55.537	55.537	55.537	55.396	55.396
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	55.639	55.639	55.636	55.634	55.639	55.639	55.634	55.634	55.634	55.634	55.636	55.636
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.88	6.94	6.83	6.91	6.83	6.83	6.81	6.73	6.91	6.76	6.81	6.73
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.064	0.084	0.053	0.102	0.046	0.119	0.058	0.107	0.076	0.107	0.048	0.114
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	231	218	214	218	231	240	240	236	222	222	231	227
Piston Avg. Diameter												
Middle and bottom of skirt	86.340		86.347		86.350		86.332		86.327		86.332	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	69.850	69.850	69.850	69.850	69.850	69.850	69.850	69.850				
Shell Diameter	F	B	F	B	F	B	F	B				
	69.926	69.926	69.921	69.921	69.926	69.926	69.924	69.924				

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	86.322-86.398
Top	0.25-1.19	Intake	6.88	Main Bearings	
Bottom		Exhaust		Journal Diameter	69.837-69.863
Cylinder Bore Diameter	86.3600-86.4110	Valve Stem to Guide Clearance		Shell Diameter	69.850-69.926
Out-of-round	0.13	Intake	0.03-0.13		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	55.537-55.563	Intake	218-254 N-m @ 42.30 mm (closed); 609-667 N-m @ 33.3 mm (open)		
Shell Diameter	55.550-55.626	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B9188
TYPE OIL: BLUE (D)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.019		0.049		0.019		0.047		0.020		0.018	
Bottom	0.032		0.031		0.027		0.032		0.024		0.021	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.4012	3.4020	3.4017	3.4018	3.4009	3.4013	3.4012	3.4015	3.4016	3.4017	3.4010	3.4015
Middle	3.4005	3.4016	3.4009	3.4020	3.4007	3.4016	3.4006	3.4015	3.4009	3.4018	3.4006	3.4015
Bottom	3.4008	3.4018	3.4011	3.4023	3.4009	3.4019	3.4007	3.4015	3.4011	3.4022	3.4008	3.4015
Out-of-round	0.0008		0.0001		0.0004		0.0003		0.0001		0.0005	
Taper	0.0004		0.0006		0.0000		0.0005		0.0005		0.0002	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.1869	2.1869	2.1869	2.1870	2.1868	2.1868	2.1868	2.1870	2.1869	2.1870	2.1870	2.1869
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.2125	2.2128	2.2131	2.2134	2.2135	2.2132	2.2135	2.2135	2.2130	2.2135	2.2130	2.2130
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.272	0.276	0.268	0.275	0.269	0.274	0.272	0.277	0.271	0.274	0.271	0.274
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0022	0.0021	0.0020	0.0020	0.0022	0.0021	0.0020	0.0023	0.0021	0.0022	0.0022	0.0022
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	142	140	135	145	145	144	137	141	140	141	135	138
Piston Avg. Diameter												
Middle and bottom of skirt	3.3994		3.4008		3.4001		3.3994		3.3999		3.4000	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	2.7498	2.7498	2.7500	2.7500	2.7500	2.7499	2.7496	2.7498				
Shell Diameter	F	B	F	B	F	B	F	B				
	2.7515	2.7515	2.7513	2.7516	2.7515	2.7518	2.7514	2.7512				

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.3985-3.4015
Top	0.010-0.047	Intake	0.271	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.7495-2.7505
Cylinder Bore Diameter	3.4000-3.4020	Valve Stem to Guide Clearance		Shell Diameter	2.7500-2.7530
Out-of-round	0.005	Intake	0.0010-0.0170		
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.1865-2.1875	Intake	49-57 lbs @ 1 11/16" (closed); 137-150 lbs @ 1 5/16" (open)		
Shell Diameter	2.1870-2.1900	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
MYRTLE BEACH AIR FORCE BASE
ENGINE TYPE: PLYMOUTH, 6 CYLINDER, 225 CID
VEHICLE NO. 78B9188
TYPE OIL: BLUE (D)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.48*		1.24		0.48		1.19		0.51		0.46	
Bottom	0.81		0.79		0.69		0.81		0.61		0.53	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	86.390	86.411	86.403	86.406	86.383	86.393	86.390	86.398	86.401	86.403	86.385	86.398
Middle	86.373	86.401	86.383	86.411	86.378	86.401	86.375	86.398	86.383	86.406	86.375	86.398
Bottom	86.380	86.406	86.388	86.418	86.383	86.408	86.378	86.398	86.388	86.416	86.380	86.398
Out-of-round	0.021		0.003		0.010		0.008		0.002		0.013	
Taper	0.010		0.015		0.000		0.012		0.013		0.005	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	55.547	55.547	55.547	55.550	55.545	55.545	55.545	55.550	55.547	55.550	55.550	55.547
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	56.198	56.205	56.213	56.220	56.223	56.215	56.223	56.223	56.210	56.223	56.210	56.210
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	6.91	7.01	7.81	6.99	6.83	6.96	6.91	7.04	6.88	6.96	6.88	6.96
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.056	0.053	0.051	0.051	0.056	0.053	0.051	0.058	0.053	0.056	0.056	0.056
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	632	623	601	645	645	641	609	627	623	627	601	614
Piston Avg. Diameter												
Middle and bottom of skirt	86.345		86.380		83.363		86.345		86.357		86.360	
Main Bearings	No. 1		No. 2		No. 3		No. 4					
Journal Diameter	H	V	H	V	H	V	H	V				
	69.845	69.845	69.850	69.850	69.850	69.847	69.840	69.845				
Shell Diameter	F	B	F	B	F	B	F	B				
	69.888	69.888	69.883	69.891	69.888	69.896	69.886	69.880				

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	86.322-86.398
Top	0.25-1.19	Intake	6.88	Main Bearings	
Bottom		Exhaust		Journal Diameter	69.837-69.863
Cylinder Bore Diameter	86.3600-86.4110	Valve Stem to Guide Clearance		Shell Diameter	69.850-69.926
Out-of-round	0.13	Intake	0.03-0.43		
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	55.537-55.563	Intake	218-254 N-m @ 42.86 mm (closed); 609-667 N-m @ 33.3 mm (open)		
Shell Diameter	55.550-55.626	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
OFFUTT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4766
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.029		0.027		0.032		0.026		0.039		0.029	
Bottom	0.033		0.029		0.029		0.027		0.029		0.028	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.8777	3.8774	3.8770	3.8775	3.8773	3.8772	3.8760	3.8770	3.8772	3.8773	3.8770	3.8777
Middle	3.8783	3.8764	3.8765	3.8772	3.8767	3.8771	3.8763	3.8767	3.8762	3.8765	3.8766	3.8773
Bottom	3.8777	3.8767	3.8771	3.8772	3.8772	3.8771	3.8770	3.8768	3.8771	3.8765	3.8767	3.8775
Out-of-round	0.0003		0.0005		0.0001		0.0010		0.0001		0.0007	
Taper	0.0000		0.0001		0.0001		0.0010		0.0001		0.0003	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.0995	2.0994	2.0996	2.0997	2.0996	2.0996	2.0996	2.0996	2.0995	2.0995	2.0996	2.0996
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1030	2.1031	2.1024	2.1020	2.1015	2.1012	2.1021	2.1019	2.1028	2.1025	2.1025	2.1027
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.229	0.228	0.232	0.226	0.229	0.229	0.220	0.215	0.213	0.216	0.201	0.202
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0012	0.0015	0.0014	0.0016	0.0014	0.0013	0.0015	0.0014	0.0014	0.0015	0.0015	0.0013
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	175	174	174	170	172	173	172	173	169	170	174	171
Piston Avg. Diameter												
Middle and bottom of skirt	3.8730		3.8728		3.8728		3.8729		3.8723		3.8723	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2988	2.2988	2.2985	2.2986	2.2984	2.2983	2.2983	2.2984	2.2982	2.2983	2.2985	2.2984	2.2983	2.2982
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.3048	2.3048	2.3009	2.3012	2.3012	2.3009	2.3018	2.3018	2.3013	2.3013	2.2994	2.3009	2.3012	2.3011

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.8700-3.8749
Top	0.010-0.030	Intake	0.2197-02237	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.2979-2.2994
Cylinder Bore Diameter	3.8745-3.8775	Valve Stem to Guide Clearance		Shell Diameter	2.2989-2.3029
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0990-2.1000	Intake	78-86 lbs @ 1.66" (closed); 170-180 lbs @ 1.26" (open)		
Shell Diameter	2.1000-2.1030	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
OFFUTT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4766
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.74*		0.69		0.81		0.66		0.99		0.74	
Bottom	0.84		0.74		0.74		0.69		0.74		0.71	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	98.494	98.486	98.476	98.489	98.483	98.481	98.450	98.476	98.481	98.483	98.476	98.494
Middle	98.509	98.461	98.463	98.481	98.468	98.478	98.458	98.468	98.455	98.463	98.466	98.483
Bottom	98.494	98.468	98.478	98.481	98.481	98.478	98.476	98.471	98.478	98.463	98.468	98.489
Out-of-round	0.008		0.013		0.002		0.026		0.002		0.018	
Taper	0.000		0.002		0.002		0.026		0.003		0.008	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.327	53.325	53.330	53.332	53.330	53.330	53.330	53.330	53.327	53.327	53.330	53.330
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.416	53.424	53.401	53.391	53.378	53.370	53.393	53.388	53.411	53.404	53.404	53.409
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	5.82	5.79	5.89	5.74	5.82	5.82	5.59	5.46	5.41	5.49	5.11	5.13
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.030	0.038	0.036	0.041	0.036	0.033	0.038	0.036	0.036	0.038	0.038	0.033
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	778	774	774	756	765	770	765	770	752	756	774	761
Piston Avg. Diameter												
Middle and bottom of skirt	98.374		98.369		98.369		98.372		98.356		98.382	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	58.390	58.390	58.382	58.384	58.379	58.377	58.377	58.379	58.374	58.377	58.382	58.379	58.377	58.374
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	58.542	58.542	58.443	58.450	58.450	58.443	58.466	58.466	58.453	58.453	58.405	58.443	58.450	58.448

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	98.298-98.422
Top	0.25-0.76	Intake	5.58-5.68	Main Bearings	
Bottom		Exhaust		Journal Diameter	58.367-58.405
Cylinder Bore Diameter	98.412-98.489	Valve Stem to Guide Clearance		Shell Diameter	58.392-58.494
Out-of-round	0.05	Intake	0.025-0.094		
Taper	0.03	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.315-53.340	Intake	347-383 N-m @ 42.16 mm (closed); 756-801 N-m @ 32.0 mm (open)		
Shell Diameter	53.340-53.416	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
OFFUTT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4768
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.028		0.027		0.032		0.027		0.030		0.029	
Bottom	0.033		0.032		0.027		0.030		0.032		0.029	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.8752	3.8752	3.8746	3.8762	3.8776	3.8775	3.8758	3.8763	3.8765	3.8757	3.8755	3.8773
Middle	3.8777	3.8767	3.8761	3.8771	3.8770	3.8778	3.8766	3.8771	3.8761	3.8767	3.8762	3.8777
Bottom	3.8779	3.8768	3.8767	3.8773	3.8775	3.8776	3.8773	3.8772	3.8768	3.8766	3.8765	3.8778
Out-of-round	0.0000		0.0016		0.0001		0.0005		0.0008		0.0018	
Taper	0.0027		0.0021		0.0001		0.0015		0.0003		0.0010	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.0993	2.0993	2.0994	2.0994	2.0994	2.0994	2.0992	2.0992	2.0991	2.0991	2.0992	2.0992
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1202	2.1205	2.1202	2.1202	2.1015	2.1015	2.1020	2.1021	2.1018	2.1019	2.1025	2.1020
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	0.220	0.232	0.182	0.224	0.204	0.224	0.227	0.219	0.230	0.225	0.217	0.217
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0015	0.0016	0.0017	0.0015	0.0016	0.0015	0.0017	0.0016	0.0015	0.0016	0.0015	0.0016
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	170	170	169	172	172	171	171	170	170	169	170	170
Piston Avg. Diameter												
Middle and bottom of skirt	3.8728		3.8735		3.8721		3.8729		3.8724		3.8729	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2990	2.2991	2.2983	2.2983	2.2985	2.2985	2.2988	2.2985	2.2988	2.2988	2.2988	2.2987	2.2988	2.2981
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.0310	2.0315	2.3005	2.3005	2.3015	2.3014	2.3020	2.3020	2.3020	2.3022	2.3018	2.3019	2.3015	2.3015

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.8700-3.8749
Top	0.010-0.030	Intake	0.2197-0.2237	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.2979-2.2994
Cylinder Bore Diameter	3.8745-3.8775	Valve Stem to Guide Clearance		Shell Diameter	2.2989-2.3029
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0990-2.1000	Intake	78-86 lbs @ 1.66" (closed); 170-180 lbs @ 1.26" (open)		
Shell Diameter	2.1000-2.1030	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
OFFUTT AIR FORCE BASE
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4768
TYPE OIL: BLUE (C)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.71+		0.69		0.81		0.69		0.76		0.74	
Bottom	0.84		0.81		0.69		0.76		0.81		0.74	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	98.430	98.430	98.415	98.455	98.491	98.489	98.445	98.458	98.463	98.443	98.438	98.483
Middle	98.494	98.468	98.453	98.478	98.476	98.486	98.466	98.478	98.453	98.468	98.455	98.494
Bottom	98.499	98.471	98.468	98.483	98.489	98.491	98.483	98.481	98.471	98.466	98.463	98.496
Out-of-round	0.000		0.040		0.002		0.013		0.020		0.045	
Taper	0.069		0.053		0.002		0.038		0.008		0.025	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.322	53.322	53.325	53.325	53.325	53.325	53.320	53.320	53.317	53.317	53.320	53.320
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.853	53.861	53.853	53.853	53.378	53.378	53.390	53.393	53.386	53.388	53.404	53.391
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	5.59	5.89	4.63	5.69	5.18	5.69	5.77	5.56	5.84	5.72	5.51	5.51
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.038	0.041	0.043	0.038	0.041	0.038	0.043	0.041	0.038	0.041	0.038	0.041
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	756	756	752	765	765	761	761	756	756	752	756	756
Piston Avg. Diameter												
Middle and bottom of skirt	98.369		98.387		98.351		98.372		98.359		98.372	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	58.395	58.397	58.377	58.377	58.382	58.382	58.390	58.382	58.390	58.390	58.390	58.387	58.390	58.372
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	58.445	58.458	58.433	58.433	58.458	58.456	58.471	58.471	58.471	58.476	58.466	58.468	58.458	58.458

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	98.298-98.422
Top	0.25-0.76	Intake	5.58-5.68	Main Bearings	
Bottom		Exhaust		Journal Diameter	58.367-58.405
Cylinder Bore Diameter	98.412-98.489	Valve Stem to Guide Clearance		Shell Diameter	58.392-58.494
Out-of-round	0.05	Intake	0.025-0.094		
Taper	0.03	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.315-53.340	Intake	347-383 N-m @ 42.16 mm (closed); 756-801 N-m @ 32.0 mm (open)		
Shell Diameter	53.340-53.416	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4571
TYPE OIL: YELLOW

Component	Cylinder No. 1	2	3	4	5	6
Compression Ring Gaps						
Top	0.027	0.025	0.025	0.020	0.022	0.025
Bottom	0.029	0.031	0.030	0.030	0.030	0.031
Cylinder Bore Diameter	L* / T	L / T	L / T	L / T	L / T	L / T
Top	3.8773 / 3.8768	3.8751 / 3.8765	3.8768 / 3.8767	3.8762 / 3.8769	3.8760 / 3.8765	3.8762 / 3.8775
Middle	3.8766 / 3.8761	3.8754 / 3.8761	3.8758 / 3.8769	3.8753 / 3.8766	3.8755 / 3.8768	3.8752 / 3.8769
Bottom	3.8768 / 3.8762	3.8754 / 3.8762	3.8764 / 3.8770	3.8762 / 3.8767	3.8762 / 3.8767	3.8756 / 3.8767
Out-of-round	0.0005	0.0014	0.0001	0.0007	0.0005	0.0013
Taper	0.0005	0.0003	0.0004	0.0000	0.0002	0.0006
Connecting Rod Bearings						
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V
	2.0990 / 2.0990	2.0990 / 2.0991	2.0989 / 2.0991	2.0992 / 2.0992	2.0988 / 2.0989	2.0989 / 2.0990
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B
	2.1202 / 2.1202	2.1205 / 2.1208	2.1018 / 2.1015	2.1028 / 2.1028	2.1025 / 2.1200	2.1202 / 2.1202
Camshaft Lobe Lift	I / E	I / E	I / E	I / E	I / E	I / E
	0.218 / 0.223	0.226 / 0.226	0.223 / 0.231	0.233 / 0.191	0.230 / 0.229	0.232 / 0.222
Valve Stem to Guide Clearance	I / E	I / E	I / E	I / E	I / E	I / E
	0.0016 / 0.0015	0.0016 / 0.0012	0.0015 / 0.0015	0.0014 / 0.0013	0.0016 / 0.0015	0.0015 / 0.0016
Valve Spring Force	I / E	I / E	I / E	I / E	I / E	I / E
	177 / 173	177 / 169	170 / 161	171 / 175	173 / 169	171 / 169
Piston Avg. Diameter Middle and bottom of skirt	3.8718	3.8715	3.8719	3.8723	3.8720	3.8726

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2990	2.2988	2.2979	2.2980	2.2984	2.2979	2.2986	2.2988	2.2985	2.2985	2.2981	2.2982	2.2986	2.2985
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.3000	2.3005	2.3005	2.3007	2.3005	2.3009	2.3010	2.3003	2.3007	2.3009	2.3004	2.3008	2.3010	2.3008

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.8700-3.8749
Top	0.010-0.030	Intake	0.2197-0.2237	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.2979-2.2994
Cylinder Bore Diameter	3.8745-3.8775	Valve Stem to Guide Clearance		Shell Diameter	2.2989-2.3029
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0990-2.1000	Intake	78-86 lbs @ 1.66" (closed); 170-180 lbs @ 1.26" (open)		
Shell Diameter	2.1000-2.1030	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4571
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.69+		0.64		0.64		0.51		0.56		0.64	
Bottom	0.74		0.79		0.76		0.76		0.76		0.79	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	98.483	98.471	98.428	98.463	98.471	98.468	98.455	98.473	98.450	98.463	98.455	98.489
Middle	98.466	98.453	98.435	98.453	98.445	98.473	98.433	98.466	98.438	98.471	98.430	98.473
Bottom	98.471	98.455	98.435	98.455	98.461	98.476	98.455	98.468	98.455	98.468	98.440	98.468
Out-of-round	0.012		0.035		0.003		0.018		0.013		0.034	
Taper	0.012		0.007		0.010		0.000		0.005		0.015	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.315	53.315	53.315	53.317	53.312	53.317	53.320	53.320	53.310	53.312	53.312	53.315
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.853	53.853	53.861	53.411	53.386	53.378	53.411	53.411	53.404	53.848	53.853	53.853
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	5.54	5.66	5.74	5.74	5.66	5.87	5.92	4.85	5.84	5.82	5.89	5.64
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.041	0.038	0.041	0.030	0.038	0.038	0.036	0.033	0.041	0.038	0.038	0.041
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	787	770	787	752	756	716	761	778	770	752	761	752
Piston Avg. Diameter												
Middle and bottom of skirt	98.344		98.336		98.346		98.356		98.349		98.466	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	58.395	58.390	59.367	58.369	58.379	58.367	58.384	58.390	58.382	58.372	58.372	58.374	58.384	58.382
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	58.420	58.433	58.433	58.438	58.433	58.443	58.445	58.428	58.438	58.443	58.430	58.440	58.445	58.440

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	98.298-98.422
Top	0.25-0.76	Intake	5.58-5.68	Main Bearings	
Bottom		Exhaust		Journal Diameter	58.367-58.405
Cylinder Bore Diameter	98.412-98.489	Valve Stem to Guide Clearance		Shell Diameter	58.392-58.494
Out-of-round	0.05	Intake	0.025-0.094		
Taper	0.03	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.315-53.340	Intake	347-383 N-m @ 42.16 mm (closed); 756-801 @ 32.0 mm (open)		
Shell Diameter	53.340-53.416	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm
@ = Measurements are in N-m

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4569
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.025		0.024		0.023		0.022		0.021		0.024	
Bottom	0.026		0.026		0.025		0.027		0.027		0.026	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T	L	T	L	T
Top	3.8765	3.8765	3.8770	3.8778	3.8759	3.8760	3.8758	3.8756	3.8761	3.8763	3.8759	3.8755
Middle	3.8759	3.8757	3.8773	3.8780	3.8752	3.8764	3.8746	3.8758	3.8760	3.8746	3.8765	3.8753
Bottom	3.8761	3.8758	3.8778	3.8782	3.8758	3.8765	3.8755	3.8761	3.8762	3.8756	3.8767	3.8754
Out-of-round	0.0000		0.0008		0.0001		0.0002		0.0002		0.0004	
Taper	0.0004		0.0008		0.0001		0.0003		0.0001		0.0008	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	2.0985	2.0985	2.0986	2.0986	2.0985	2.0985	2.0985	2.0985	2.0985	2.0985	2.0985	2.0985
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	2.1028	2.1028	2.1026	2.1026	2.1024	2.1024	2.1025	2.1025	2.1025	2.1025	2.1028	2.1028
Camshaft Lobe Lift	Not measured											
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.0028	0.0031	0.0030	0.0030	0.0028	0.0029	0.0029	0.0030	0.0030	0.0028	0.0029	0.0031
Valve Spring Force	I	E	I	E	I	E	I	E	I	E	I	E
	82	83	81	80	80	82	81	80	82	82	81	81
Piston Avg. Diameter												
Middle and bottom of skirt	3.8720		3.8725		3.8720		3.8722		3.8725		3.8725	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	2.2985	2.2985	2.2984	2.2984	2.2984	2.2984	2.2984	2.2984	2.2984	2.2984	2.2985	2.2985	2.2985	2.2985
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	2.3003	2.3003	2.3002	2.3002	2.3010	2.3010	2.3020	2.3020	2.3000	2.3000	2.3018	2.3018	2.3010	2.3010

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.8700-3.8749
Top	0.010-0.030	Intake	0.2197-0.2237	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.2979-2.2994
Cylinder Bore Diameter	3.8745-3.8775	Valve Stem to Guide Clearance		Shell Diameter	2.2989-2.3029
Out-of-round	0.002	Intake	0.0010-0.0037		
Taper	0.001	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0993-2.1000	Intake	78-86 lbs @ 1.66" (closed); 170-180 lbs @ 1.25" (open)		
Shell Diameter	2.1000-2.1030	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B4569
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.64*		0.61		0.58		0.56		0.53		0.61	
Bottom	0.66		0.66		0.64		0.69		0.69		0.66	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	98.463	98.463	98.476	98.496	98.448	98.450	98.445	98.440	98.453	98.458	98.448	98.438
Middle	98.448	98.443	98.483	98.501	98.430	98.461	98.415	98.445	98.450	98.415	98.463	98.433
Bottom	98.453	98.445	98.496	98.506	98.445	98.463	98.438	98.453	98.455	98.440	98.468	98.435
Out-of-round	0.000		0.020		0.002		0.005		0.010		0.010	
Taper	0.010		0.020		0.003		0.007		0.002		0.020	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.302	53.302	53.304	53.304	53.302	53.302	53.302	53.302	53.302	53.302	53.302	53.302
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.411	53.411	53.406	53.406	53.401	53.401	53.404	53.404	53.404	53.404	53.411	53.411
Camshaft Lobe Lift	Not measured											
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.071	0.079	0.076	0.076	0.071	0.074	0.074	0.076	0.076	0.071	0.074	0.079
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	365	369	360	356	356	365	360	356	365	365	360	360
Piston Avg. Diameter												
Middle and bottom of skirt	98.349		98.362		98.349		98.354		98.362		98.362	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	58.382	58.382	58.379	58.379	58.379	58.379	58.379	58.379	58.379	58.379	58.382	58.382	58.382	58.382
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	58.428	58.428	58.425	58.425	58.445	58.445	58.471	58.471	58.420	58.420	58.466	58.466	58.445	58.445

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	98.298-98.422
Top	0.25-0.76	Intake	5.58-5.68	Main Bearings	
Bottom		Exhaust		Journal Diameter	58.367-58.405
Cylinder Bore Diameter	98.412-98.489	Valve Stem to Guide Clearance		Shell Diameter	58.392-58.494
Out-of-round	0.05	Intake	0.025-0.094		
Taper	0.03	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.315-53.340	Intake	347-383 N-m @ 42.16 mm (closed); 756-801 N-m @ 32.0 mm (open)		
Shell Diameter	53.340-53.416	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B8831
TYPE OIL: BLUE (D)

Component	Cylinder No. 1	2	3	4	5	6
Compression Ring Gaps						
Top	0.024	0.026	0.025	0.029	0.024	0.024
Bottom	0.027	0.025	0.027	0.026	0.026	0.026
Cylinder Bore Diameter	L* / T	L / T	L / T	L / T	L / T	L / T
Top	3.8771 / 3.8778	3.8764 / 3.8763	3.8764 / 3.8765	3.8759 / 3.8768	3.8759 / 3.8771	3.8770 / 3.8778
Middle	3.8760 / 3.8772	3.8757 / 3.8765	3.8760 / 3.8765	3.8759 / 3.8766	3.8758 / 3.8765	3.8764 / 3.8771
Bottom	3.8761 / 3.8774	3.8762 / 3.8765	3.8765 / 3.8765	3.8764 / 3.8765	3.8763 / 3.8766	3.8766 / 3.8772
Out-of-round	0.0007	0.0001	0.0001	0.0009	0.0012	0.0008
Taper	0.0010	0.0002	0.0001	0.0005	0.0004	0.0004
Connecting Rod Bearings						
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V
	2.0989 / 2.0989	2.0990 / 2.0990	2.0988 / 2.0988	2.0990 / 2.0990	2.0990 / 2.0990	2.0990 / 2.0990
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B
	2.1030 / 2.1030	2.1027 / 2.1027	2.1028 / 2.1028	2.1026 / 2.1026	2.1025 / 2.1025	2.1028 / 2.1028
Camshaft Lobe Lift	I / E	I / E	I / E	I / E	I / E	I / E
	0.224 / 0.227	0.226 / 0.220	0.221 / 0.231	0.225 / 0.204	0.218 / 0.218	0.220 / 0.219
Valve Stem to Guide Clearance	I / E	I / E	I / E	I / E	I / E	I / E
	0.0030 / 0.0034	0.0029 / 0.0028	0.0022 / 0.0024	0.0031 / 0.0028	0.0020 / 0.0026	0.0036 / 0.0026
Valve Spring Force	I / E	I / E	I / E	I / E	I / E	I / E
	80 / 79	81 / 80	80 / 79	81 / 80	81 / 82	81 / 80
Piston Avg. Diameter						
Middle and bottom of skirt	3.8731	3.8730	3.8722	3.8724	3.8725	3.8726

Main Bearings	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Journal Diameter	H / V	H / V	H / V	H / V	H / V	H / V	H / V
	2.2985 / 2.2985	2.2984 / 2.2984	2.2984 / 2.2984	2.2985 / 2.2985	2.2984 / 2.2984	2.2984 / 2.2984	2.2985 / 2.2985
Shell Diameter	F / B	F / B	F / B	F / B	F / B	F / B	F / B
	2.3038 / 2.3038	2.3021 / 2.3021	2.3012 / 2.3012	2.3008 / 2.3008	2.3005 / 2.3005	2.3000 / 2.3000	2.3005 / 2.3005

Manufacturer's Service Limits, Inches

Compression Ring Gaps	
Top	0.010-0.030
Bottom	
Cylinder Bore Diameter	3.8745-3.8775
Out-of-round	0.002
Taper	0.001
Connecting Rod Bearings	
Journal Diameter	2.0990-2.1000
Shell Diameter	2.1000-2.1030
Camshaft Lobe Lift	
Intake	0.2197-0.2237
Exhaust	
Valve Stem to Guide Clearance	
Intake	0.0010-0.0037
Exhaust	
Valve Spring Force	
Intake	78-86 lbs @ 1.66" (closed); 170-180 lbs @ 1.26" (open)
Exhaust	
Piston Diameter	3.8700-3.8749
Main Bearings	
Journal Diameter	2.2979-2.2994
Shell Diameter	2.2989-2.3029

ENGINE COMPONENTS MEASUREMENTS
PETERSON FIELD
ENGINE TYPE: CHEVROLET, 6 CYLINDER, 292 CID
VEHICLE NO. 78B8831
TYPE OIL: BLUE (D)

Component	Cylinder No. 1		2		3		4		5		6	
Compression Ring Gaps												
Top	0.61*		0.66		0.64		0.74		0.61		0.61	
Bottom	0.69		0.64		0.69		0.66		0.66		0.66	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T	L	T	L	T
Top	98.478	98.496	98.461	98.458	98.461	98.463	98.448	98.471	98.448	98.478	98.476	98.496
Middle	98.450	98.481	98.443	98.463	98.450	98.463	98.448	98.466	98.445	98.463	98.461	98.478
Bottom	98.453	98.486	98.455	98.463	98.463	98.463	98.461	98.463	98.458	98.466	98.466	98.481
Out-of-round	0.018		0.003		0.002		0.023		0.030		0.020	
Taper	0.025		0.005		0.002		0.013		0.010		0.010	
Connecting Rod Bearings												
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V
	53.312	53.312	53.315	53.315	53.310	53.310	53.315	53.315	53.315	53.315	53.315	53.315
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B
	53.416	53.416	53.409	53.409	53.411	53.411	53.406	53.406	53.404	53.404	53.411	53.411
Camshaft Lobe Lift	I	E	I	E	I	E	I	E	I	E	I	E
	5.69	5.77	5.74	5.54	5.61	5.87	5.72	5.18	5.54	5.54	5.59	5.56
Valve Stem to Guide Clearance	I	E	I	E	I	E	I	E	I	E	I	E
	0.076	0.086	0.074	0.071	0.056	0.061	0.079	0.071	0.051	0.066	0.091	0.066
Valve Spring Force@	I	E	I	E	I	E	I	E	I	E	I	E
	356	351	360	356	356	351	360	356	360	365	360	356
Piston Avg. Diameter												
Middle and bottom of skirt	98.377		98.374		98.354		98.359		98.362		98.364	

Main Bearings	No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7	
Journal Diameter	H	V	H	V	H	V	H	V	H	V	H	V	H	V
	58.382	58.382	58.379	58.379	58.379	58.379	58.382	58.382	58.379	58.379	58.379	58.379	58.382	58.382
Shell Diameter	F	B	F	B	F	B	F	B	F	B	F	B	F	B
	58.517	58.517	58.473	58.473	58.450	58.450	58.440	58.440	58.433	58.433	58.420	58.420	58.433	58.433

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	98.298-98.422
Top	0.25-0.76	Intake	5.58-5.68	Main Bearings	
Bottom		Exhaust		Journal Diameter	58.367-58.405
Cylinder Bore Diameter	98.412-98.489	Valve Stem to Guide Clearance		Shell Diameter	58.392-58.494
Out-of-round	0.05	Intake	0.025-0.094		
Taper	0.03	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	53.315-53.340	Intake	347-383 N-m @ 42.20 mm (closed); 756-801 @ 32.0 mm (open)		
Shell Diameter	53.340-53.416	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
* = Measurements are in mm
@ = Measurements are in (N-m)

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 79B5719
TYPE OIL: YELLOW

Component	Cylinder No. 1		2		3		4	
Compression Ring Gaps								
Top	0.030		0.028		0.030		0.029	
Bottom	0.028		0.028		0.030		0.028	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T
Top	3.7802	3.7825	3.7809	3.7815	3.7809	3.7819	3.7807	3.7812
Middle	3.7802	3.7822	3.7805	3.7814	3.7805	3.7819	3.7800	3.7812
Bottom	3.7804	3.7819	3.7809	3.7813	3.7808	3.7818	3.7801	3.7813
Out-of-round	0.0023		0.0006		0.0010		0.0005	
Taper	0.0002		0.0000		0.0001		0.0006	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
	2.0465	2.0465			2.0465	2.0466		
Shell Diameter	Not measured							
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	0.242	0.243	0.241	0.242	0.242	0.241	0.242	0.240
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	3.7794		3.7795		3.7797		3.7795	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
	2.3989	2.3989			2.3987	2.3986		
Shell Diameter	Not measured							

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.7792-3.7798
Top	0.010-0.020	Intake	0.2387-02437	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	3.7795-3.7831	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4016
Out-of-round	0.005	Intake			
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0464-2.0472	Intake			
Shell Diameter	2.0472-2.0498	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 79B5719
TYPE OIL: YELLOW

Component	Cylinder No. 1		Cylinder No. 2		Cylinder No. 3		Cylinder No. 4	
Compression Ring Gaps								
Top	0.76+		0.71		0.76		0.74	
Bottom	0.71		0.71		0.76		0.71	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T
Top	96.017	96.076	96.035	96.050	96.035	96.060	96.030	96.042
Middle	96.017	96.068	96.025	96.048	96.025	96.060	96.012	96.042
Bottom	96.022	96.060	96.035	96.045	96.032	96.058	96.015	96.045
Out-of-round	0.058		0.015		0.025		0.013	
Taper	0.005		0.000		0.003		0.015	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
	51.981	51.981			51.981	51.984		
Shell Diameter	Not measured							
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	6.15	6.17	6.12	6.15	6.15	6.12	6.15	6.10
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	95.997		95.999		96.004		95.999	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
	60.932	60.932			60.927	60.924		
Shell Diameter	Not measured							

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	95.992-96.007
Top	0.25-0.51	Intake	6.06-6.19	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	95.999-96.091	Valve Stem to Guide Clearance		Shell Diameter	60.935-61.001
Out-of-round	0.13	Intake			
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	51.979-51.999	Intake			
Shell Diameter	51.999-52.065	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 79B5720
TYPE OIL: BLUE (A)

Component	Cylinder No. 1		2		3		4	
Compression Ring Gaps								
Top	0.025		0.024		0.028		0.022	
Bottom	0.025		0.028		0.025		0.023	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T
Top	3.7796	3.7813	3.7810	3.7813	3.7810	3.7819	3.7802	3.7807
Middle	3.7796	3.7812	3.7806	3.7811	3.7804	3.7818	3.7798	3.7809
Bottom	3.7797	3.7809	3.7806	3.7811	3.7808	3.7819	3.7797	3.7808
Out-of-round	0.0017		0.0003		0.0009		0.0005	
Taper	0.0001		0.0004		0.0002		0.0005	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
			2.0465	2.0464			2.0465	2.0464
Shell Diameter	Not measured							
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	0.242	0.242	0.242	0.245	0.243	0.244	0.242	0.243
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force@	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	3.7797		3.7800		3.7801		3.7797	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
			2.3987	2.3988			2.3985	2.3986
Shell Diameter	Not measured							

Manufacturer's Service Limits, Inches

Compression Ring Gaps		**Camshaft Lobe Lift**		**Piston Diameter**	3.7792-3.7798
Top	0.010-0.020	Intake	0.2387-02437	**Main Bearings**	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	3.7795-3.7831	**Valve Stem to Guide Clearance**		Shell Diameter	2.3990-2.4016
Out-of-round	0.005	Intake			
Taper	0.010	Exhaust			
Connecting Rod Bearings		**Valve Spring Force**			
Journal Diameter	2.0464-2.0472	Intake			
Shell Diameter	2.0472-2.0498	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 7985720
TYPE OIL: BLUE (A)

Component	Cylinder No. 1		2		3		4	
Compression Ring Gaps								
Top	0.64*		0.61		0.71		0.56	
Bottom	0.64		0.71		0.64		0.58	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T
Top	96.002	96.045	96.037	96.045	96.037	96.060	96.017	96.030
Middle	96.002	96.042	96.027	96.040	96.022	96.058	96.007	96.035
Bottom	96.004	96.035	96.027	96.040	96.032	96.060	96.004	96.032
Out-of-round	0.043		0.008		0.023		0.013	
Taper	0.003		0.010		0.005		0.013	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
Shell Diameter	Not measured		51.981	51.981			51.981	51.979
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	6.15	6.15	6.15	6.22	6.17	6.20	6.15	6.17
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	96.004		96.012		96.015		96.004	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
Shell Diameter	Not measured		60.927	60.930			60.922	60.924

Manufacturer's Service Limits, (mm)

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	95.992-96.007
Top	0.25-0.51	Intake	6.06-6.19	Main Bearings	
Bottom		Exhaust		Journal Diameter	60.914-60.935
Cylinder Bore Diameter	95.999-96.091	Valve Stem to Guide Clearance		Shell Diameter	60.935-61.001
Out-of-round	0.13	Intake			
Taper	0.25	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	51.979-51.999	Intake			
Shell Diameter	51.999-52.065	Exhaust			

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 79B5721
TYPE OIL: GREEN

Component	Cylinder No. 1		2		3		4	
Compression Ring Gaps								
Top	0.027		0.025		0.026		0.028	
Bottom	0.032		0.026		0.027		0.030	
Cylinder Bore Diameter	L*	T	L	T	L	T	L	T
Top	3.7802	3.7823	3.7805	3.7815	3.7807	3.7824	3.7810	3.7821
Middle	3.7796	3.7820	3.7801	3.7815	3.7800	3.7822	3.7802	3.7821
Bottom	3.7799	3.7818	3.7805	3.7813	3.7805	3.7821	3.7804	3.7823
Out-of-round	0.0021		0.0010		0.0017		0.0011	
Taper	0.0003		0.0000		0.0006		0.0006	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
	2.0468	2.0468					2.0467	2.0467
Shell Diameter	Not measured							
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	0.241	0.242	0.246	0.240	0.241	0.242	0.241	0.244
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	3.7801		3.7795		3.7802		3.7797	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
	2.3988	2.3988					2.3987	2.3986
Shell Diameter	Not measured							

Manufacturer's Service Limits, Inches

Compression Ring Gaps		Camshaft Lobe Lift		Piston Diameter	3.7792-3.7798
Top	0.010-0.020	Intake	0.2387-02437	Main Bearings	
Bottom		Exhaust		Journal Diameter	2.3982-2.3990
Cylinder Bore Diameter	3.7795-3.7831	Valve Stem to Guide Clearance		Shell Diameter	2.3990-2.4016
Out-of-round	0.005	Intake			
Taper	0.010	Exhaust			
Connecting Rod Bearings		Valve Spring Force			
Journal Diameter	2.0464-2.0472	Intake			
Shell Diameter	2.0472-2.0498	Exhaust			

ENGINE COMPONENTS MEASUREMENTS
RANDOLPH AIR FORCE BASE
ENGINE TYPE: FORD, 4 CYLINDER, 2.3 LITRE
VEHICLE NO. 79B5721
TYPE OIL: GREEN

Component	Cylinder No. 1		Cylinder No. 2		Cylinder No. 3		Cylinder No. 4	
Compression Ring Gaps								
Top	0.69*		0.64		0.66		0.71	
Bottom	0.81		0.66		0.69		0.76	
Cylinder Bore Diameter	L	T	L	T	L	T	L	T
Top	96.017	96.070	96.025	96.050	96.030	96.073	96.037	96.065
Middle	96.002	96.063	96.015	96.050	96.012	96.068	96.017	96.065
Bottom	96.009	96.058	96.025	96.045	96.025	96.065	96.022	96.070
Out-of-round	0.053		0.025		0.043		0.028	
Taper	0.008		0.000		0.005		0.015	
Connecting Rod Bearings								
Journal Diameter	H	V	H	V	H	V	H	V
	51.989	51.989					51.986	51.986
Shell Diameter	Not measured							
Camshaft Lobe Lift	I	E	I	E	I	E	I	E
	6.12	6.15	6.25	6.10	6.12	6.15	6.12	6.20
Valve Stem to Guide Clearance	Not measured							
Valve Spring Force	Not measured							
Piston Avg. Diameter								
Middle and bottom of skirt	96.015		95.999		96.017		96.004	
Main Bearings	No. 1		No. 2		No. 3		No. 4	
Journal Diameter	H	V	H	V	H	V	H	V
	60.930	60.930					60.927	60.924
Shell Diameter	Not measured							

Manufacturer's Service Limits, (mm)

Compression Ring Gaps	
Top	0.25-0.51
Bottom	
Cylinder Bore Diameter	95.999-96.091
Out-of-round	0.13
Taper	0.25
Connecting Rod Bearings	
Journal Diameter	51.979-51.999
Shell Diameter	51.999-52.065
Camshaft Lobe Lift	
Intake	6.06-6.19
Exhaust	
Valve Stem to Guide Clearance	
Intake	
Exhaust	
Valve Spring Force	
Intake	
Exhaust	
Piston Diameter	95.992-96.007
Main Bearings	
Journal Diameter	60.914-60.935
Shell Diameter	60.935-61.001

*L = Longitudinal, T = Transversal, H = Horizontal, V = Vertical,
F = Forward, B = Back, I = Intake, E = Exhaust
+ = Measurements are in mm

APPENDIX C

ENGINE INSPECTION DATA-
PHOTOGRAPHS

USAF Academy Vehicle 79B5659
Lubricant: Green

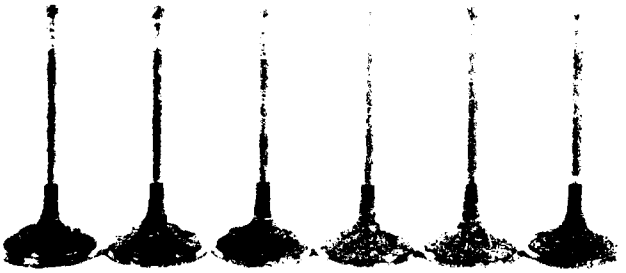
Piston No. 1 Thrust Side

Anti-Thrust Side

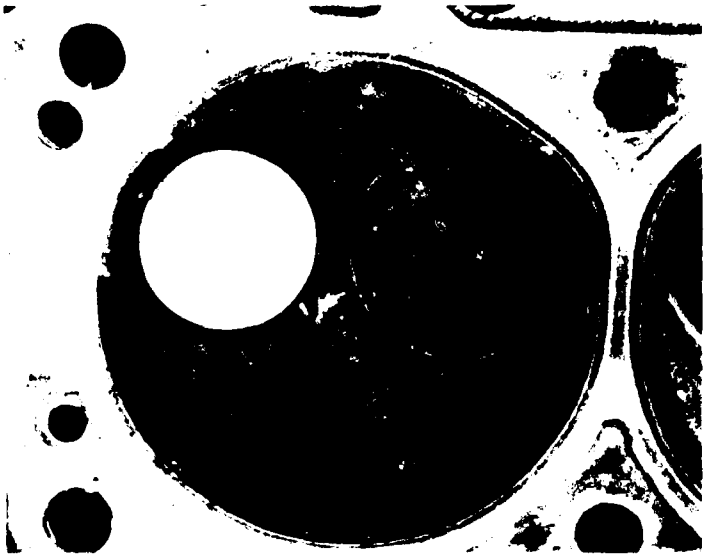
Piston No. 2 Thrust Side

Anti-Thrust Side

USAF Academy Vehicle 79B5659
Lubricant: Green



Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

USAF Academy Vehicle 79B5660
Lubricant: Yellow

Piston No. 1 Thrust Side

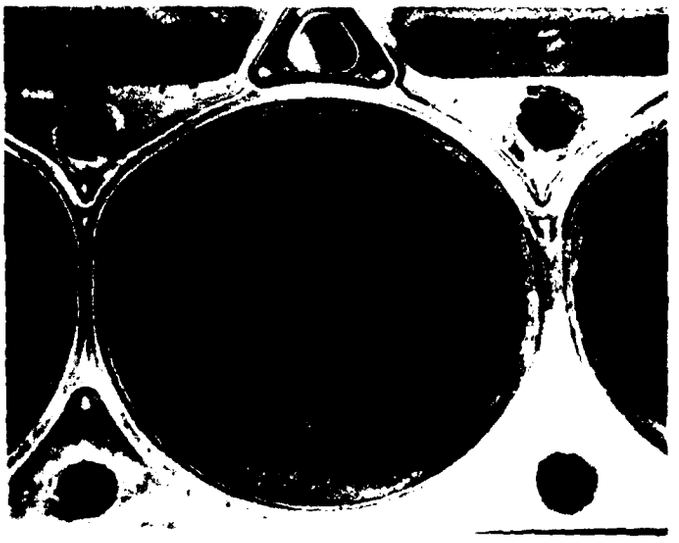
Anti-Thrust Side

Piston No. 2 Thrust Side

Anti-Thrust Side

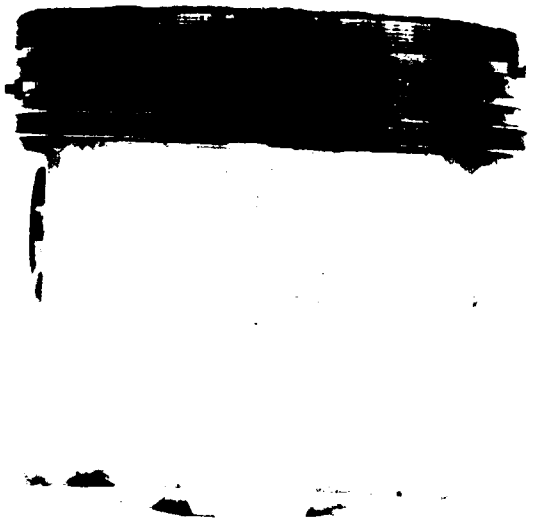
USAF Academy Vehicle 79B5660
Lubricant: Yellow

Intake Valves 1-6

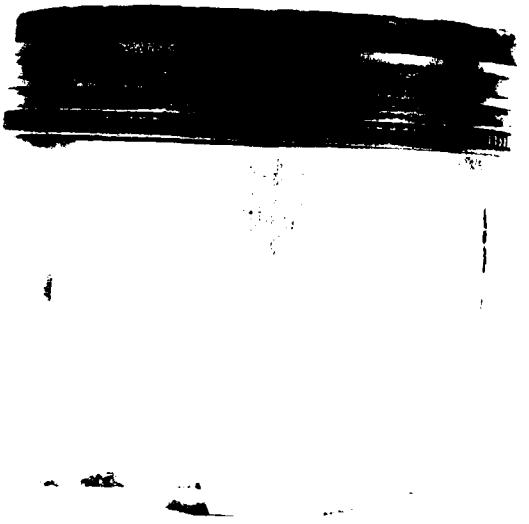


Cylinder Head Combustion Chamber No. 2

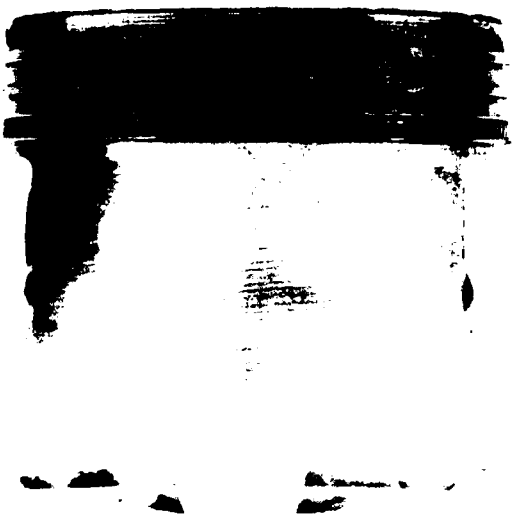
USAF Academy Vehicle 79B5668
Lubricant: Blue(C)



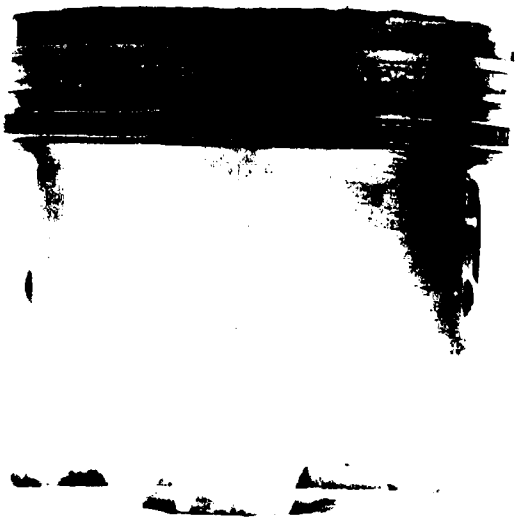
Piston No. 1 Thrust Side



Anti-Thrust Side

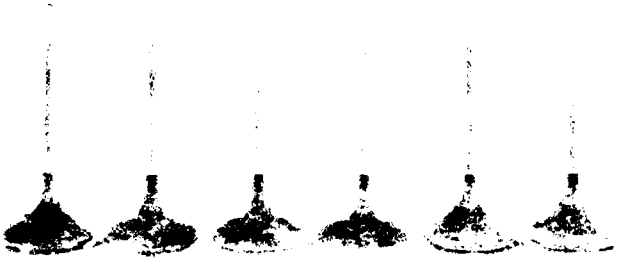


Piston No. 2 Thrust Side

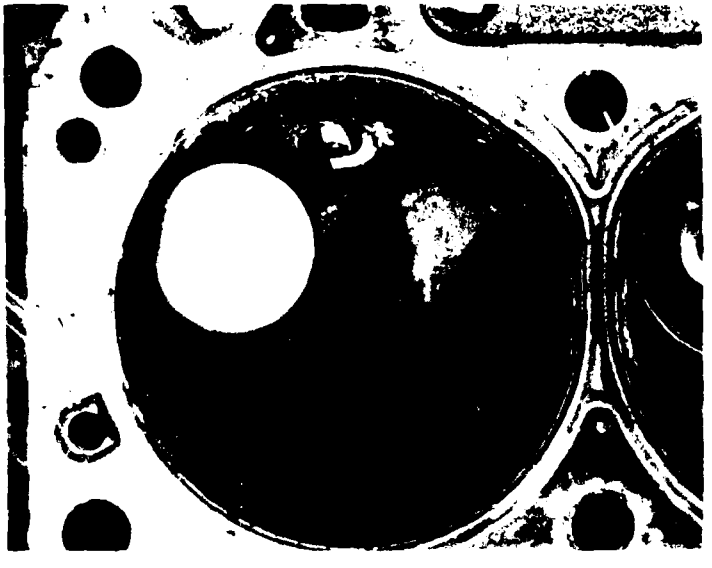


Anti-Thrust Side

USAF Academy Vehicle 79B5668
Lubricant: Blue(C)



Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

George AFB Vehicle 79B2533
Lubricant: Green

Piston No. 1 Thrust Side

Anti-Thrust Side

Piston No. 3 Thrust Side

Anti-Thrust Side

George AFB Vehicle 79B2533
Lubricant: Green

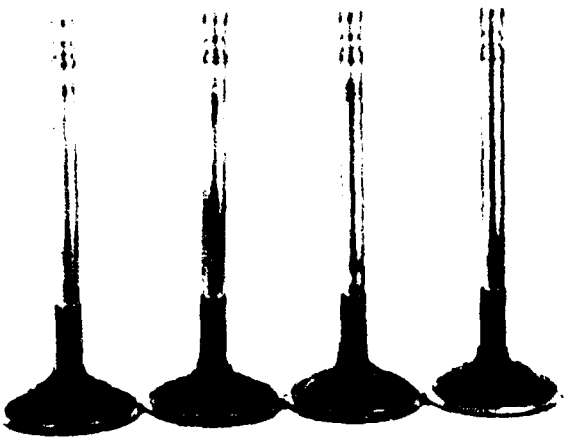
Piston No. 2 Thrust Side

Anti-Thrust Side

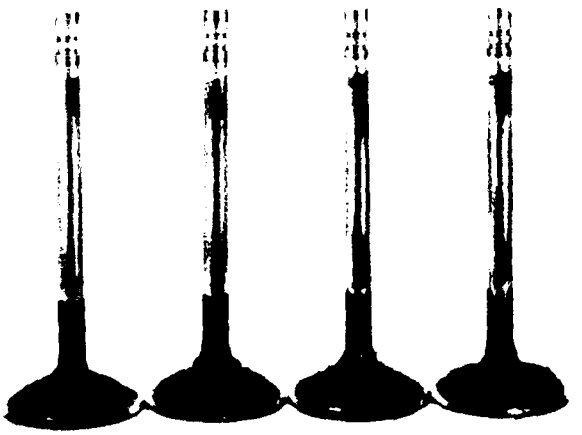
Piston No. 4 Thrust Side

Anti-Thrust Side

George AFB Vehicle 79B2533
Lubricant: Green



Intake Valves 1-4 Left



Intake Valves 1-4 Right

George AFB Vehicle 79B2533
Lubricant: Green

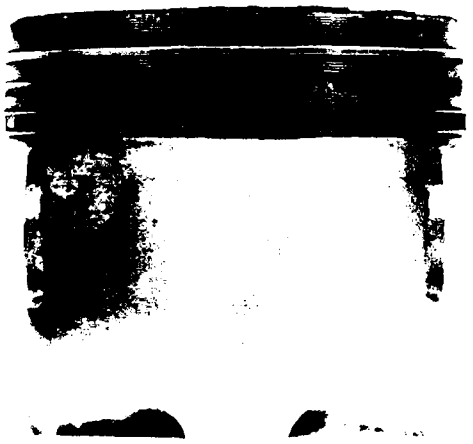
Cylinder Head Combustion Chamber No. 1 Left

Cylinder Head Combustion Chamber No. 1 Right

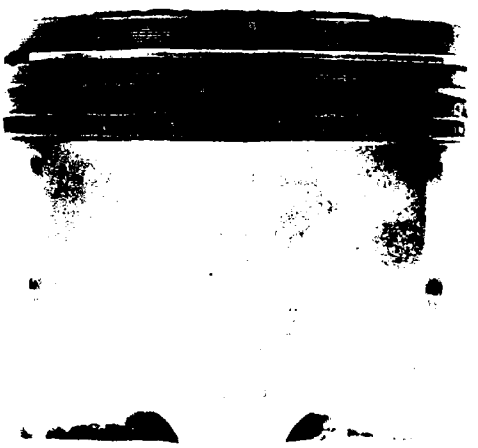
George AFB Vehicle 79B2534
Lubricant: Yellow

Piston No. 1 Thrust Side

Anti-Thrust Side



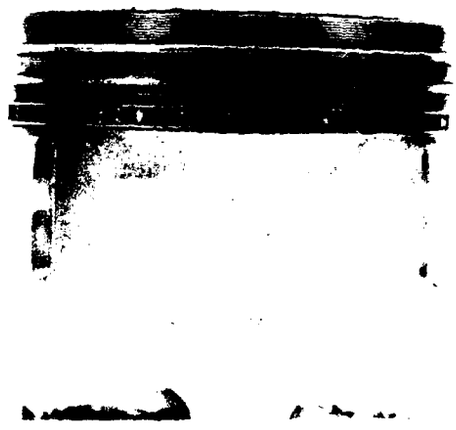
Piston No. 3 Thrust Side



Anti-Thrust Side

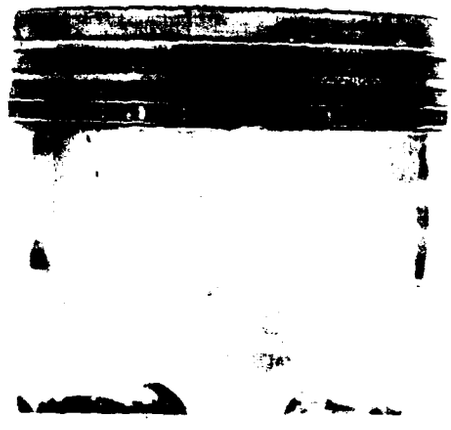
George AFB Vehicle 79B2534
Lubricant: Yellow

Piston No. 2 Thrust Side



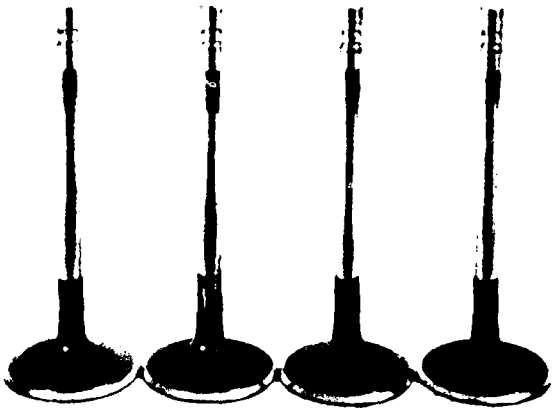
Anti-Thrust Side

Piston No. 4 Thrust Side

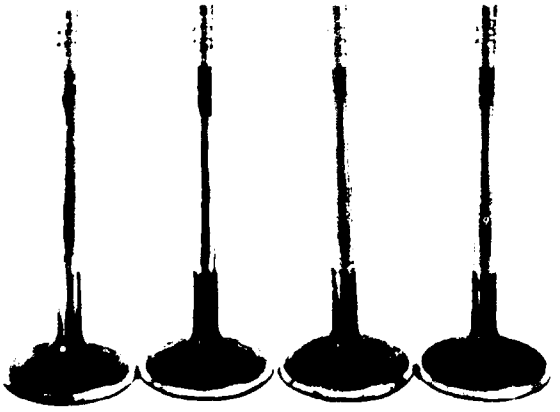


Anti-Thrust Side

George AFB Vehicle 79B2534
Lubricant: Yellow

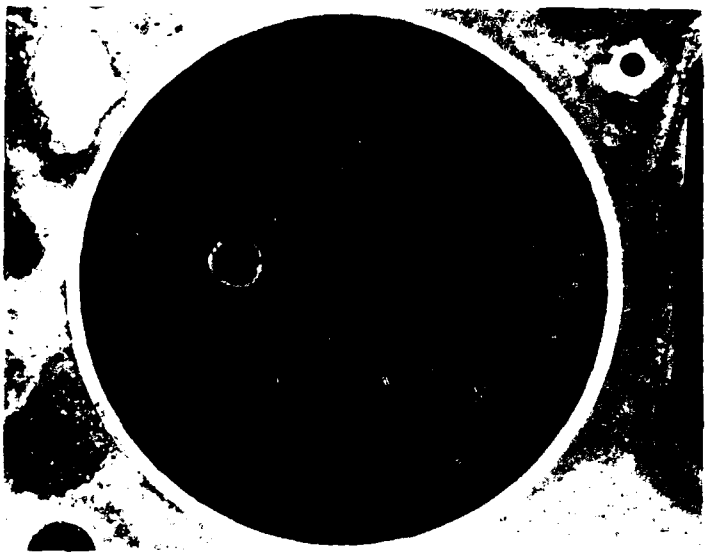


Intake Valves 1-4 Left

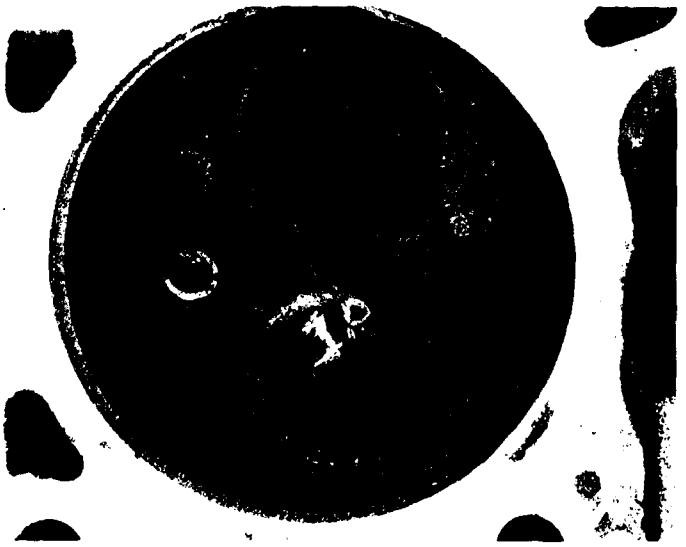


Intake Valves 1-4 Right

George AFB Vehicle 79B2534
Lubricant: Yellow



Cylinder Head Combustion Chamber No. 1 Left



Cylinder Head Combustion Chamber No. 1 Right

George AFB Vehicle 79B2539
Lubricant: Blue(C)

Piston No. 1 Thrust Side

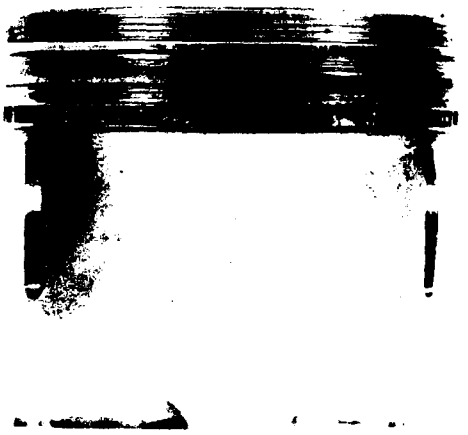
Anti-Thrust Side

Piston No. 3 Thrust Side

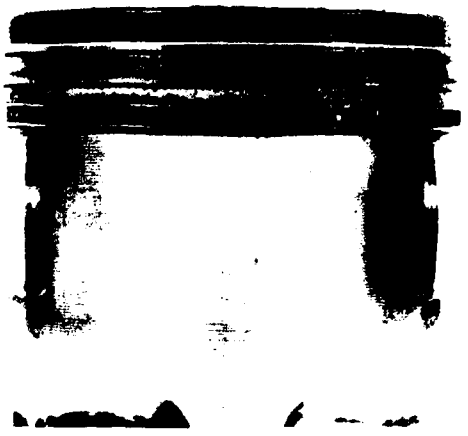
Anti-Thrust Side

George AFB Vehicle 79B2539
Lubricant: Blue(C)

Piston No. 2 Thrust Side



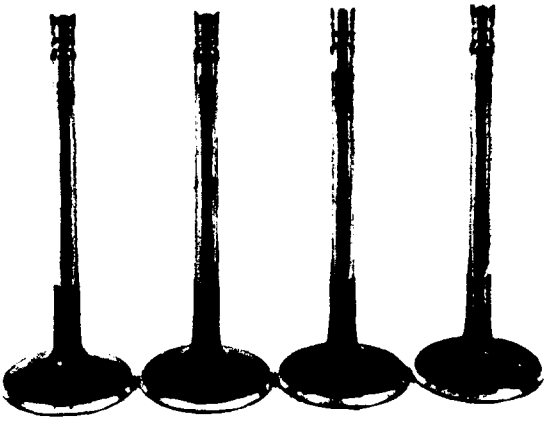
Anti-Thrust Side



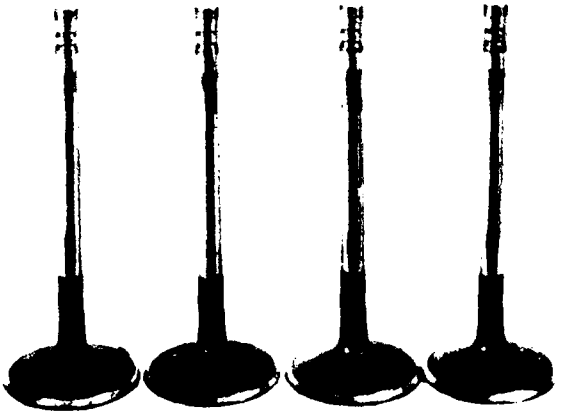
Piston No. 4 Thrust Side

Anti-Thrust Side

George AFB Vehicle 79B2539
Lubricant: Blue(C)

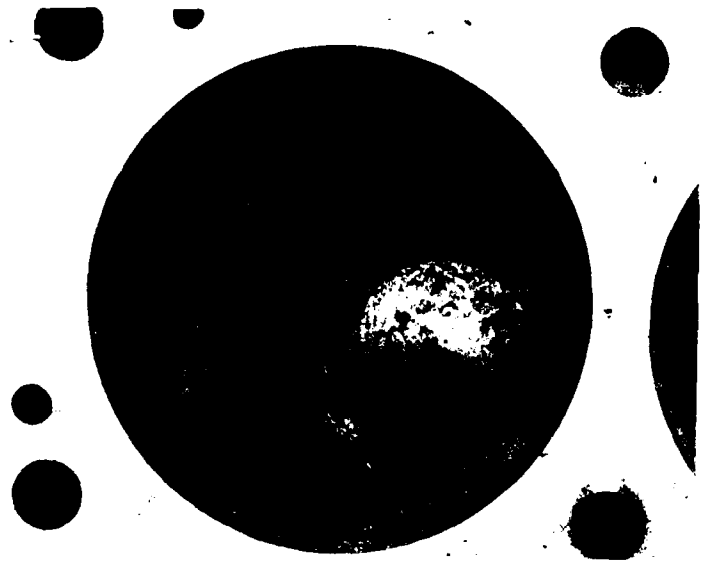


Intake Valves 1-4 Left

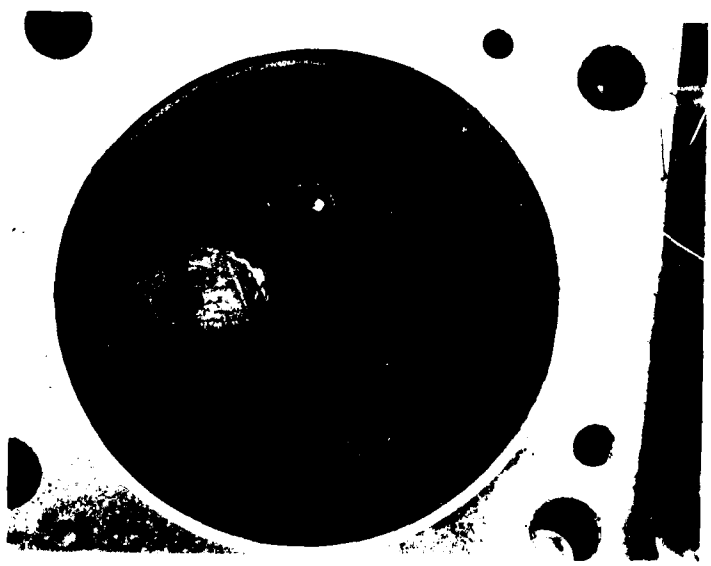


Intake Valves 1-4 Right

George AFB Vehicle 79B2539
Lubricant: Blue(C)



Cylinder Head Combustion Chamber No. 1 Left



Cylinder Head Combustion Chamber No. 1 Right

Grand Forks AFB Vehicle 79B1734
Lubricant: Yellow

Piston No. 1 Thrust Side

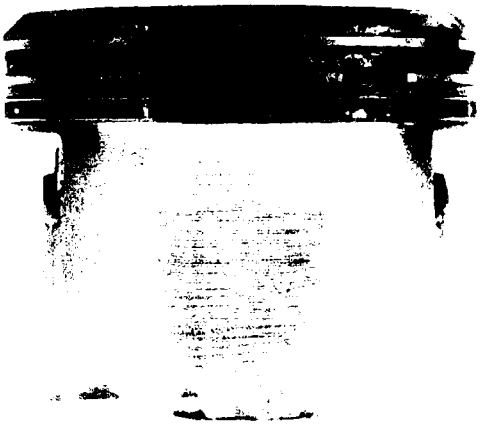
Anti-Thrust Side

Piston No. 3 Thrust Side

Anti-Thrust Side

Grand Forks AFB Vehicle 79B1734
Lubricant: Yellow

Piston No. 2 Thrust Side

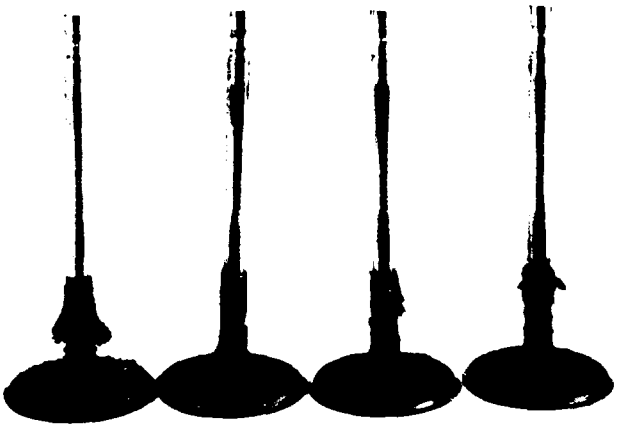


Anti-Thrust Side

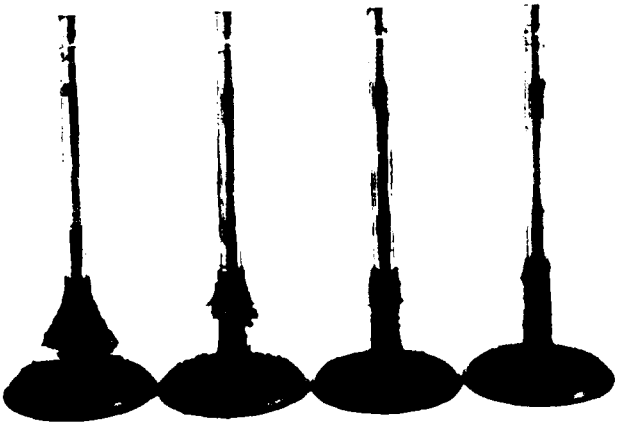
Piston No. 4 Thrust Side

Anti-Thrust Side

Grand Forks AFB Vehicle 79B1734
Lubricant: Yellow

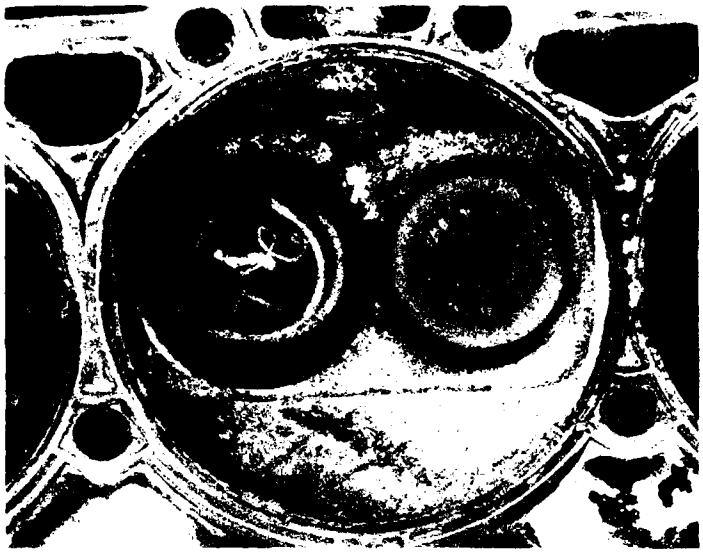


Intake Pistons 1-4 Left

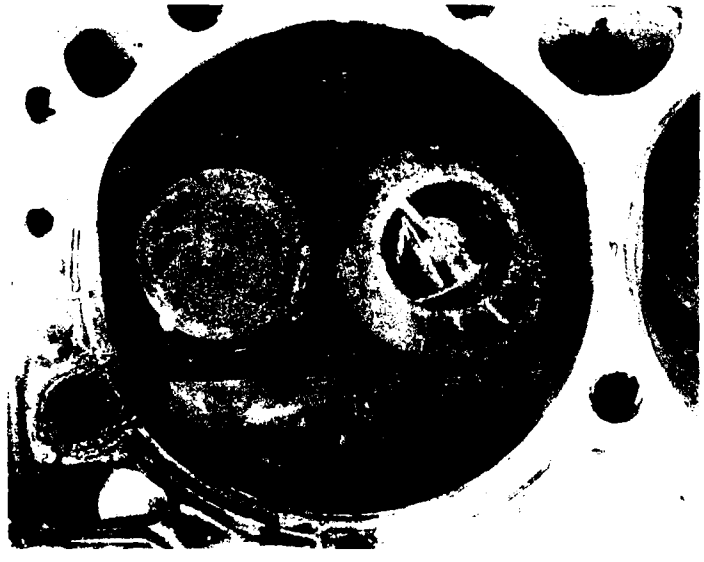


Intake Pistons 1-4 Right

Grand Forks AFB Vehicle 79B1734
Lubricant: Yellow

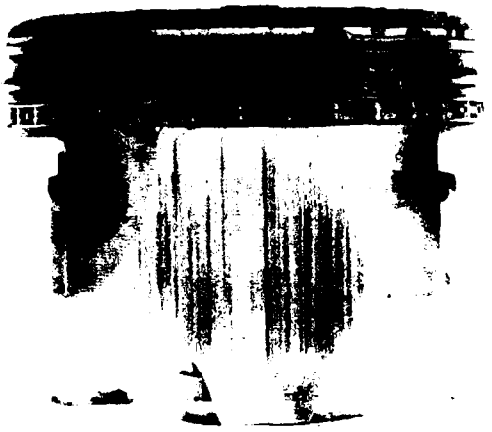


Cylinder Head Combustion Chamber No. 2 Left



Cylinder Head Combustion Chamber No. 1 Right

Grand Forks AFB Vehicle 79B1735
Lubricant: Blue(B)



Piston No. 1 Thrust Side

Anti-Thrust Side

Piston No. 3 Thrust Side

Anti-Thrust Side

Grand Forks AFB Vehicle 79B1735
Lubricant: Blue(B)

Piston No. 2 Thrust Side

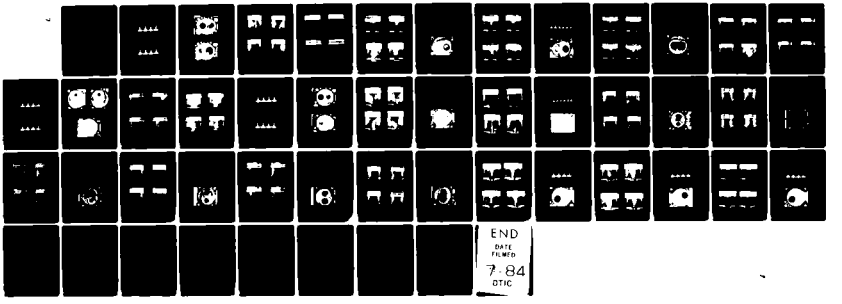
Anti-Thrust Side

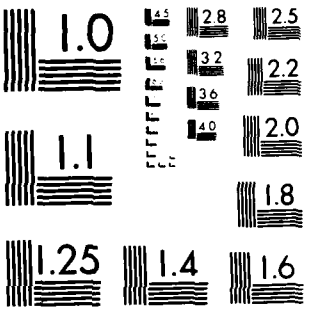
Piston No. 4 Thrust Side

Anti-Thrust Side

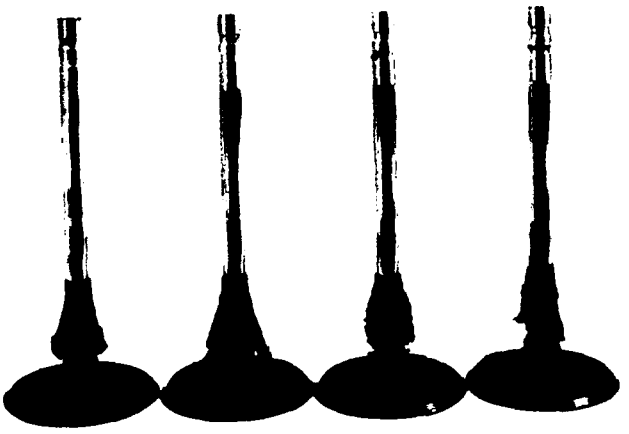
AD-A141 881 INSPECTION DATA FOR SPARK IGNITION ENGINES FROM AIR FORCE NONTACTICAL VEH..(U) SOUTHWEST RESEARCH INST SAN ANTONIO TX ARMY FUELS AND LUBRICA.. W E BUTLER ET AL. 2/2

UNCLASSIFIED JAN 83 AFLRL-163-VOL-2 DAAK70-82-C-0001 F/G 11/8 NL

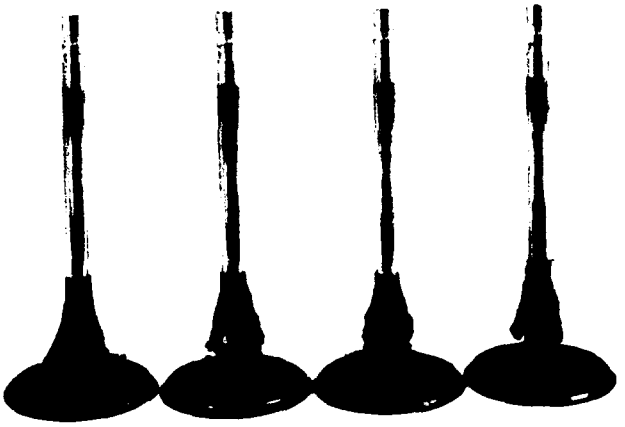




Grand Forks AFB Vehicle 79B1735
Lubricant: Blue(B)



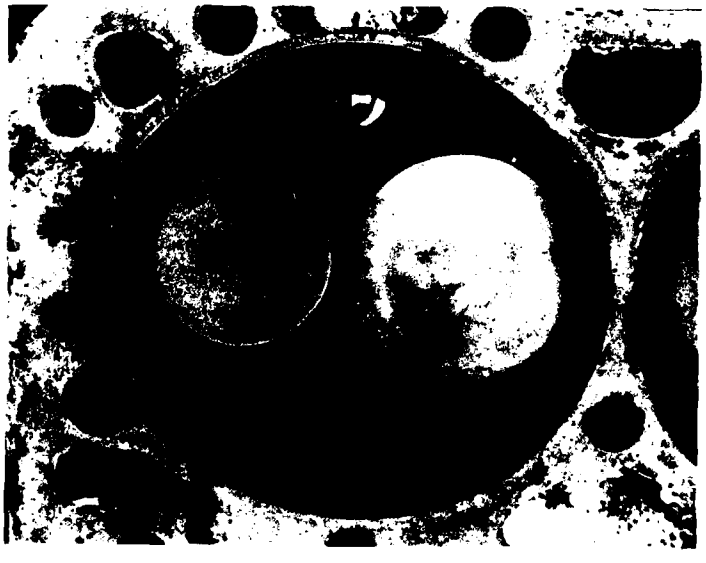
Intake Valves 1-4 Left



Intake Valves 1-4 Right

Grand Forks AFB Vehicle 79B1735
Lubricant: Blue(B)

Cylinder Head Combustion Chamber No. 1 Left



Cylinder Head Combustion Chamber No. 1 Right

Hancock Field Vehicle 78B5038
Lubricant: Green

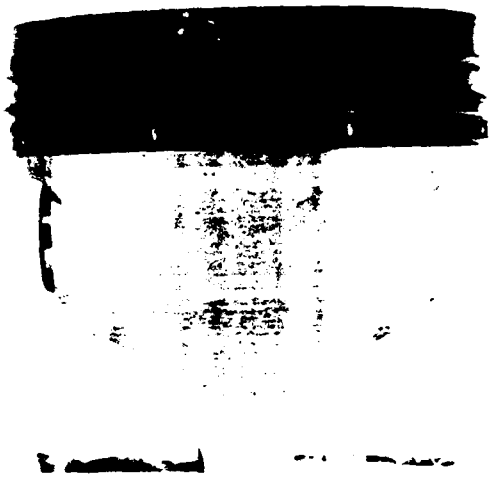
Piston No. 1 Thrust Side

Anti-Thrust Side

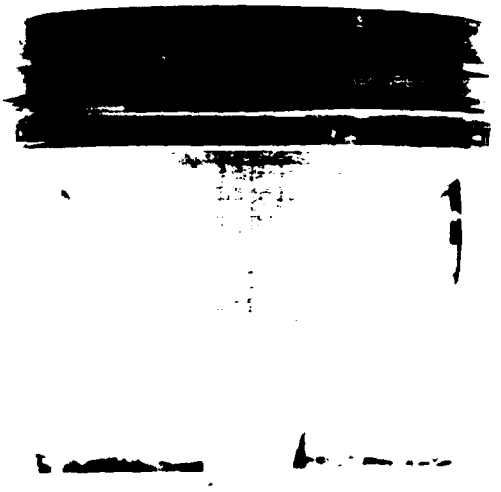
Piston No. 2 Thrust Side

Anti-Thrust Side

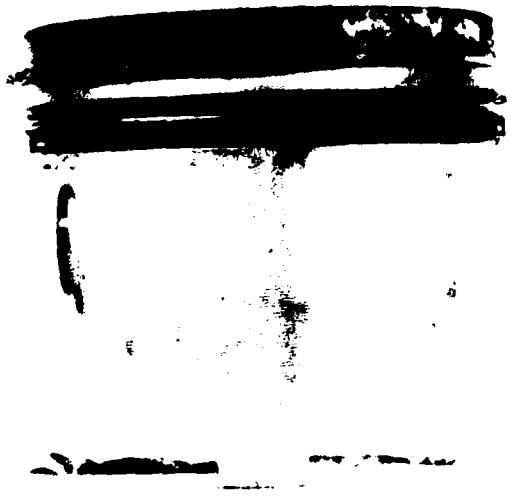
Hancock Field Vehicle 78B5646
Lubricant: Yellow



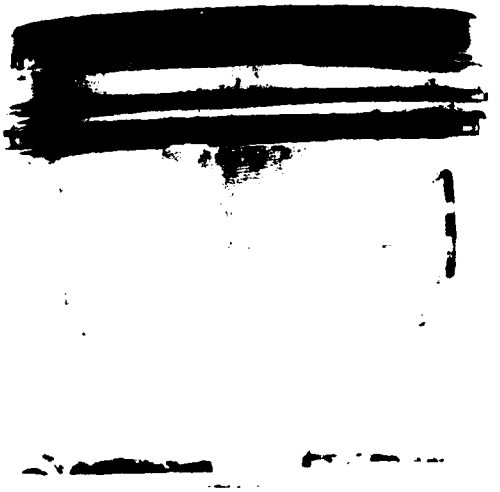
Piston No. 2 Thrust Side



Anti-Thrust Side



Piston No. 4 Thrust Side



Anti-Thrust Side

Lackland AFB Vehicle 79B2270
Lubricant: Yellow

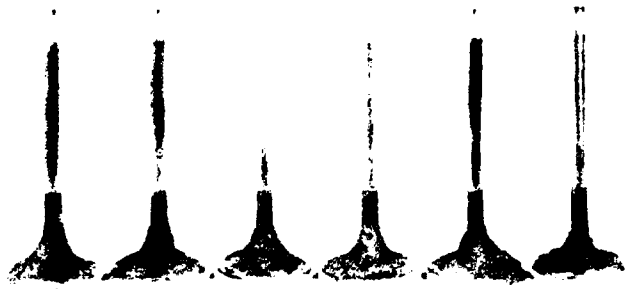
Piston No. 1 Thrust Side

Anti-Thrust Side

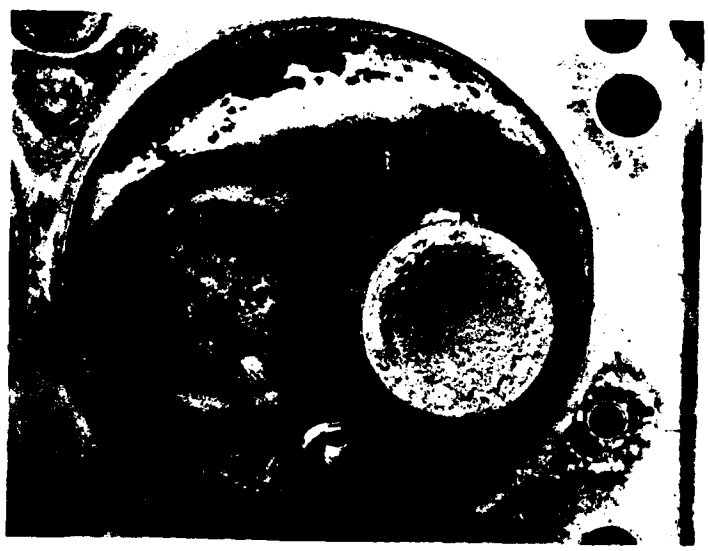
Piston No. 2 Thrust Side

Anti-Thrust Side

Lackland AFB Vehicle 79B2270
Lubricant: Yellow

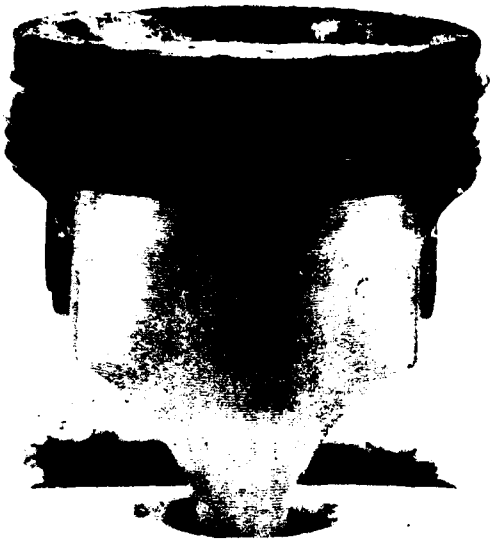


Intake Valves 1-6



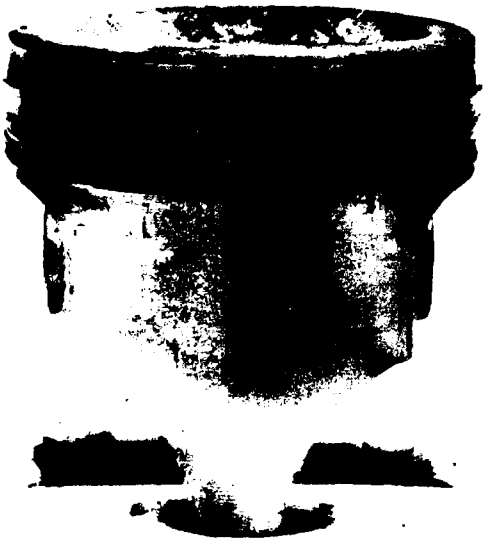
Cylinder Head Combustion Chamber No. 1

Lackland AFB Vehicle 79B2271
Lubricant: Green



Piston No. 1 Thrust Side

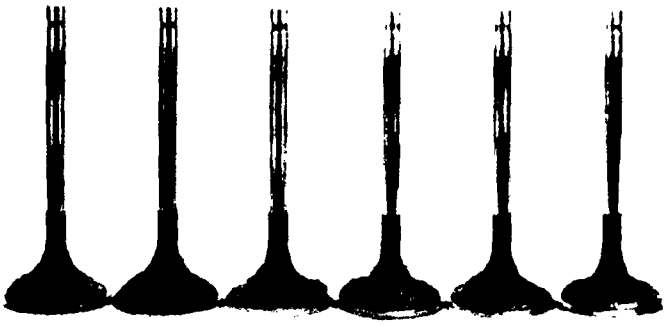
Anti-Thrust Side



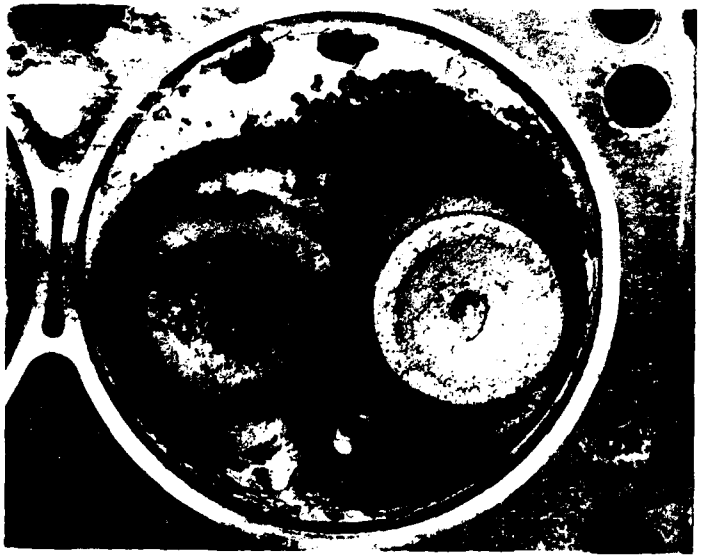
Piston No. 2 Thrust Side

Anti-Thrust Side

Lackland AFB Vehicle 79B2271
Lubricant: Green



Intake Valves 1-6

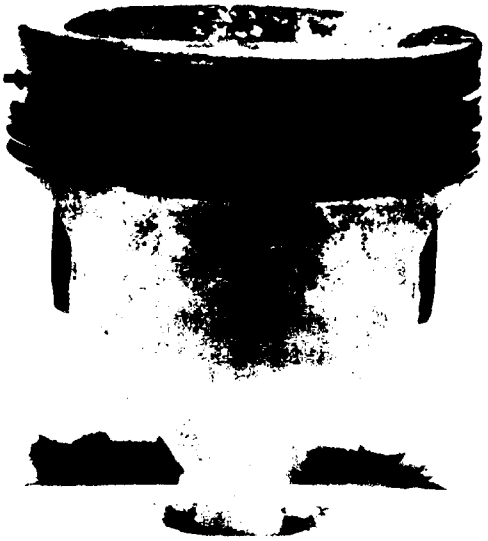


Cylinder Head Combustion Chamber No. 1

Lackland AFB Vehicle 79B2272
Lubricant: Blue(A)

Piston No. 1 Thrust Side

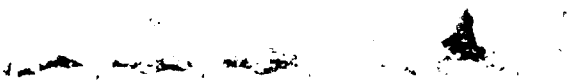
Anti-Thrust Side



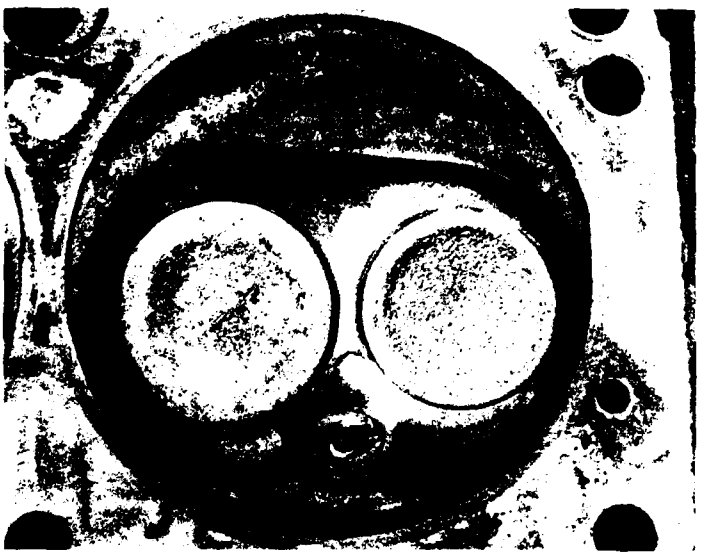
Piston No. 2 Thrust Side

Anti-Thrust Side

Lackland AFB Vehicle 79B2272
Lubricant: Blue(A)



Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

Minot AFB Vehicle 79B1736
Lubricant: Green

Piston No. 1 Thrust Side

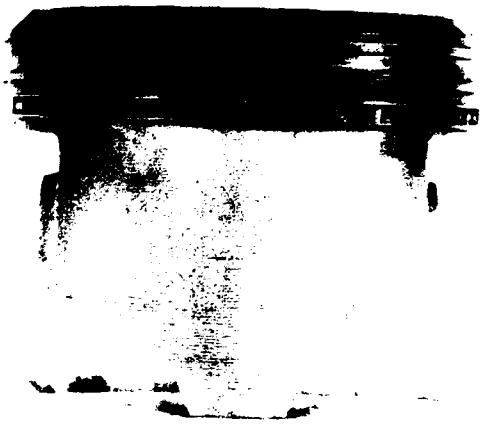
Anti-Thrust Side

Piston No. 3 Thrust Side

Anti-Thrust Side

Minot AFB Vehicle 79B1736
Lubricant: Green

Piston No. 2 Thrust Side

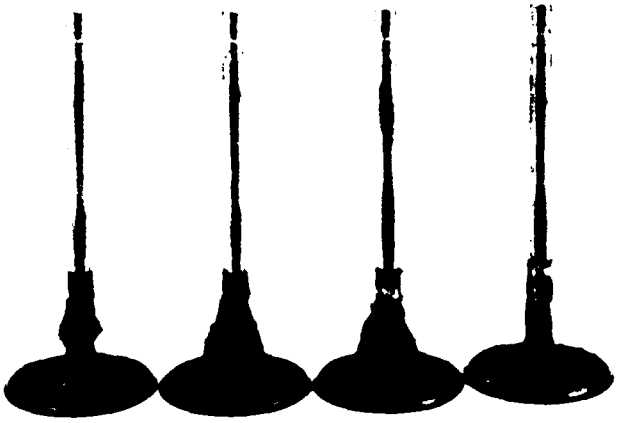


Anti-Thrust Side

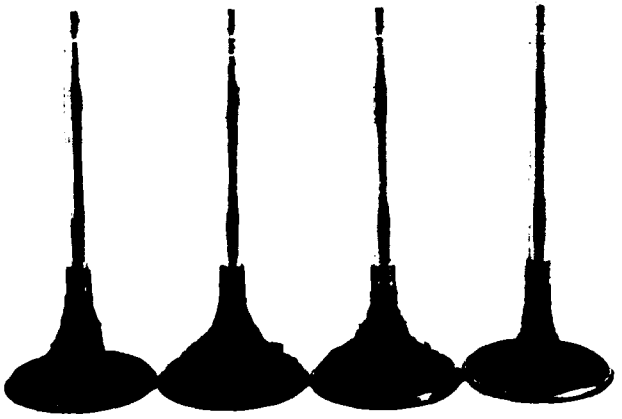
Piston No. 4 Thrust Side

Anti-Thrust Side

Minot AFB Vehicle 79B1736
Lubricant: Green

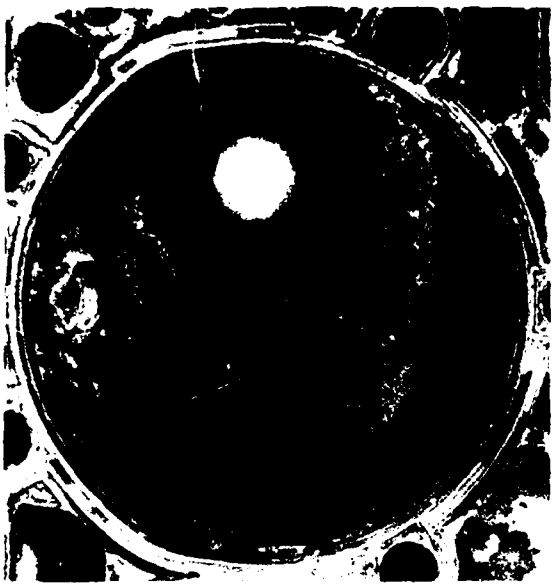


Intake Valves 1-4 Left

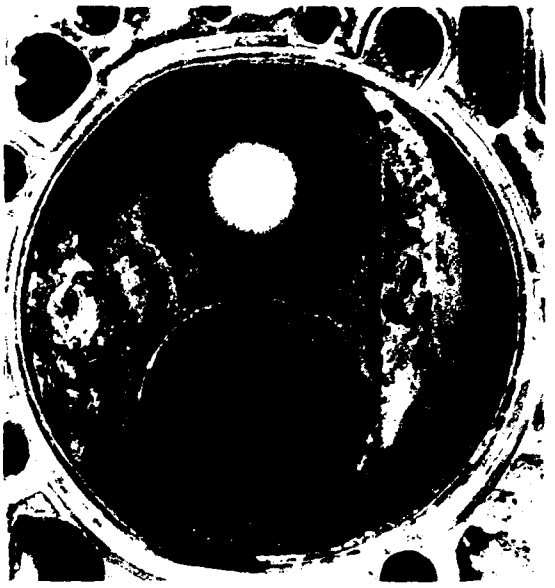


Intake Valves 1-4 Right

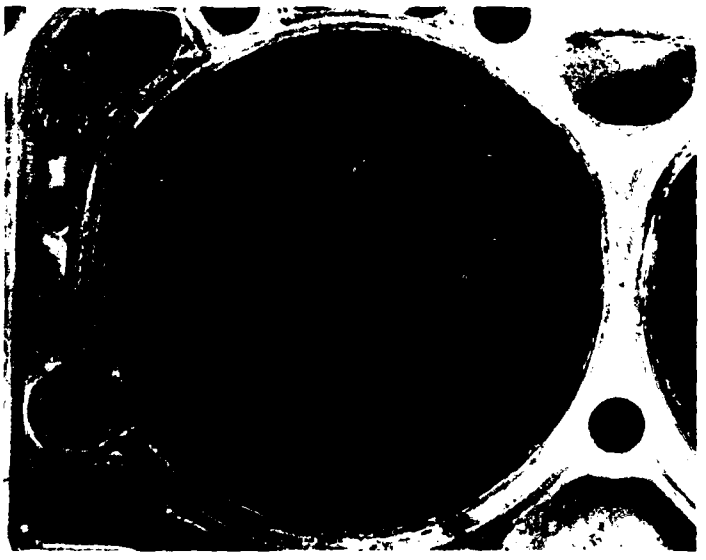
Minot AFB Vehicle 79B1736
Lubricant: Green



Cylinder Head Combustion Chamber
No. 4 Right

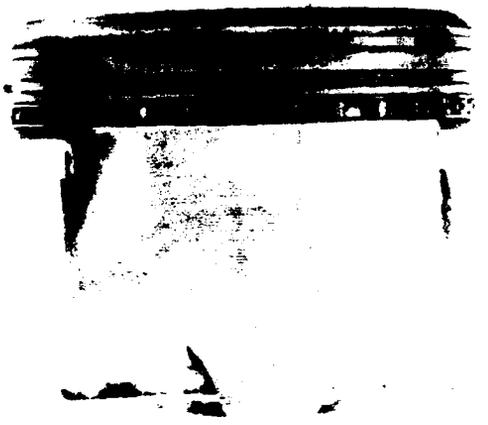


Cylinder Head Combustion Chamber
No. 4 Right w/o Intake Valve



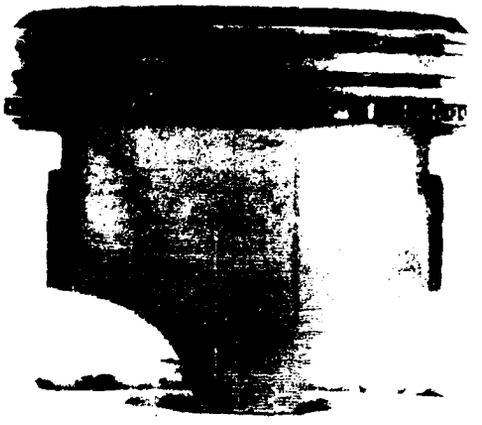
Cylinder Head Combustion Chamber No. 4 Left

Minot AFB Vehicle 79B1759
Lubricant: Blue(C)



Piston No. 1 Thrust Side

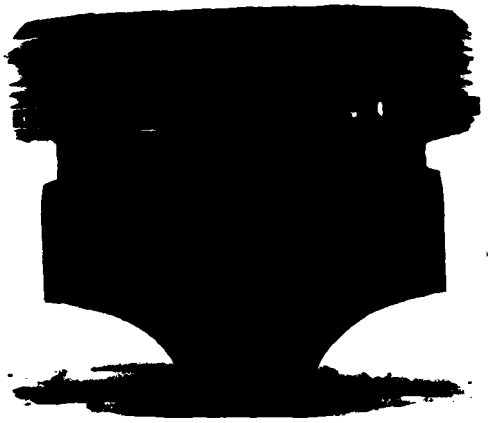
Anti-Thrust Side



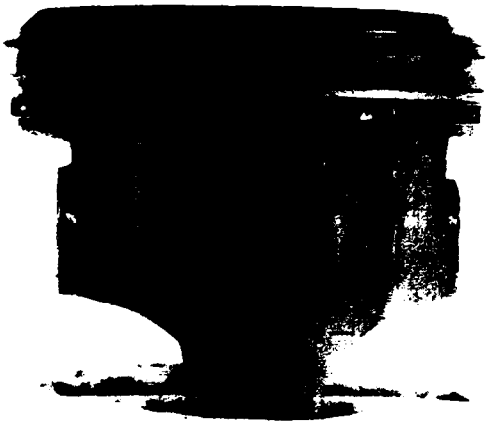
Piston No. 3 Thrust Side

Anti-Thrust Side

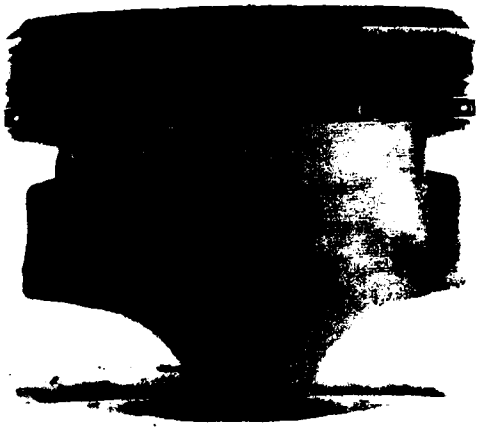
Minot AFB Vehicle 79B1759
Lubricant: Blue(C)



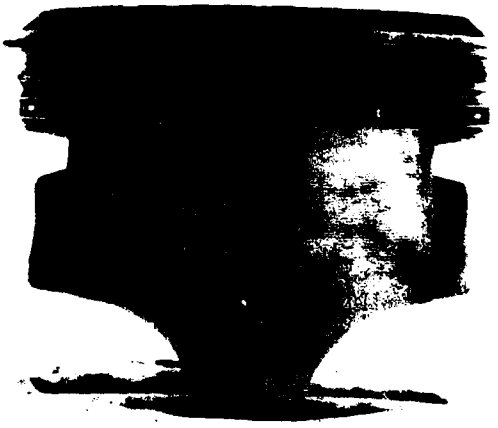
Piston No. 2 Thrust Side



Anti-Thrust Side

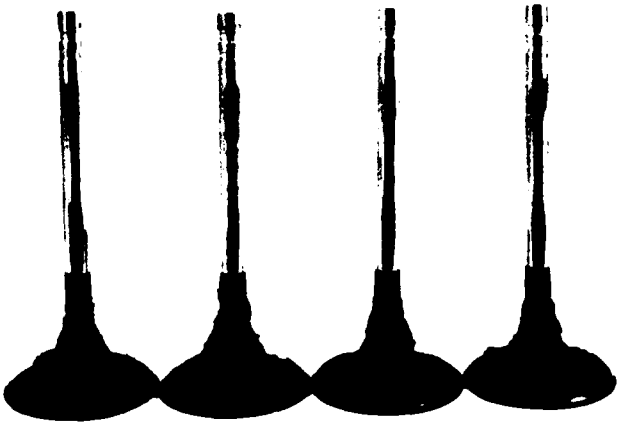


Piston No. 4 Thrust Side

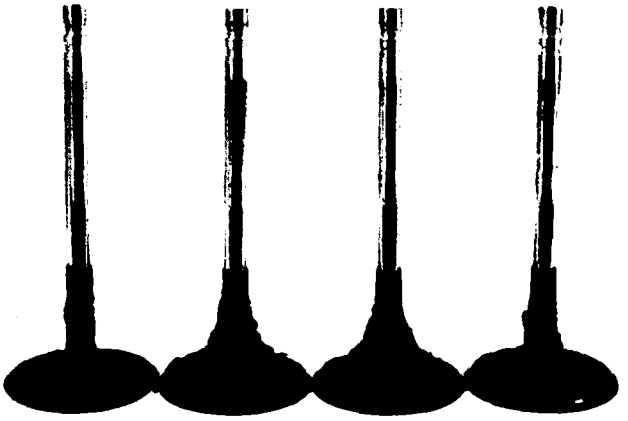


Anti-Thrust Side

Minot AFB Vehicle 79B1759
Lubricant: Blue(C)

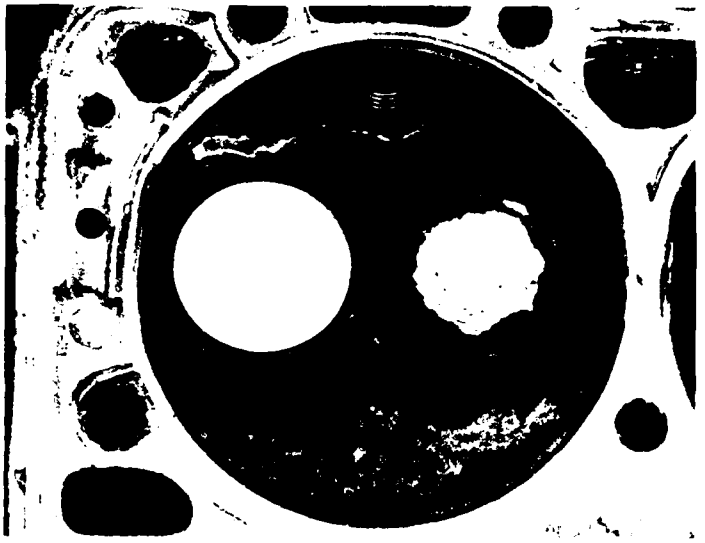


Intake Valves 1-4 Left

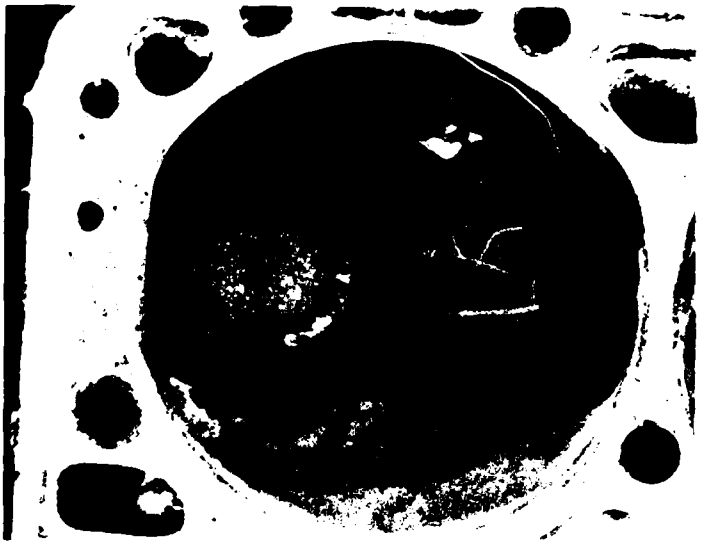


Intake Valves 1-4 Right

Minot AFB Vehicle 79B1759
Lubricant: Blue(C)



Cylinder Head Combustion Chamber No. 1 Left



Cylinder Head Combustion Chamber No. 1 Right

Myrtle Beach Vehicle 79B5212
Lubricant: Green

Piston No. 2 Thrust Side

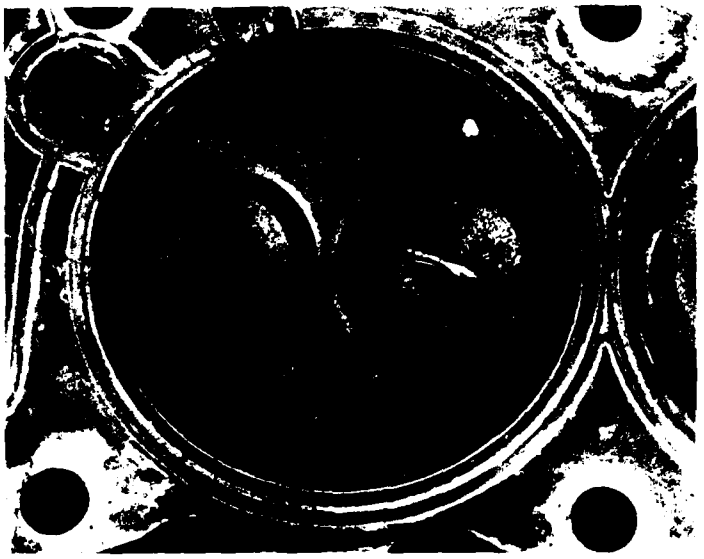
Anti-Thrust Side

Piston No. 4 Thrust Side

Anti-Thrust Side

Myrtle Beach Vehicle 7985212
Lubricant: Green

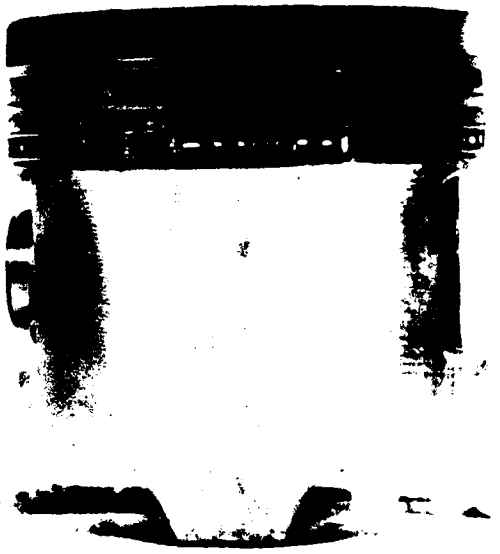
Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

Myrtle Beach Vehicle 78B9187
Lubricant: Yellow

Piston No. 2 Thrust Side

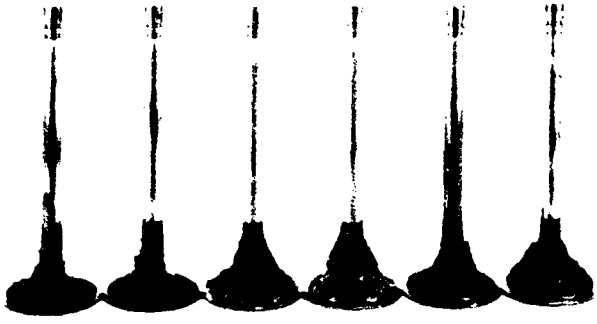


Anti-Thrust Side

Piston No. 4 Thrust Side

Anti-Thrust Side

Myrtle Beach Vehicle 78B9187
Lubricant: Yellow



Intake Valves 1-6

Cylinder Head Combustion Chamber No. 1

Myrtle Beach Vehicle 78B9188
Lubricant: Blue(D)

Piston No. 2 Thrust Side

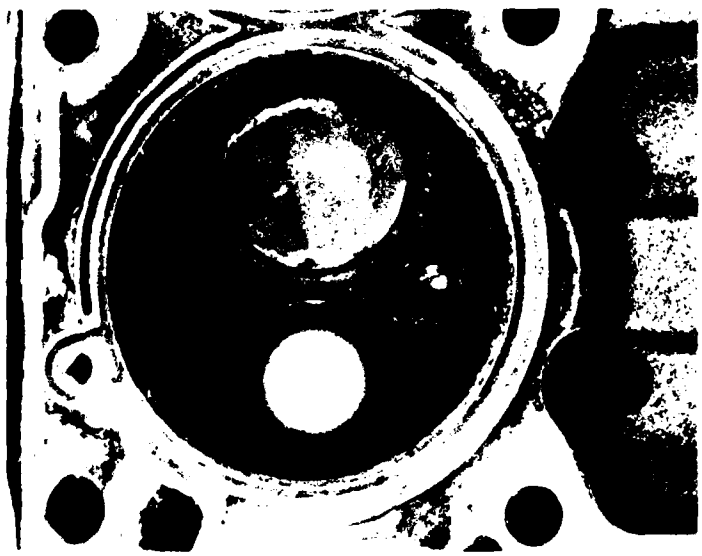
Anti-Thrust Side

Piston No. 4 Thrust Side

Anti-Thrust Side

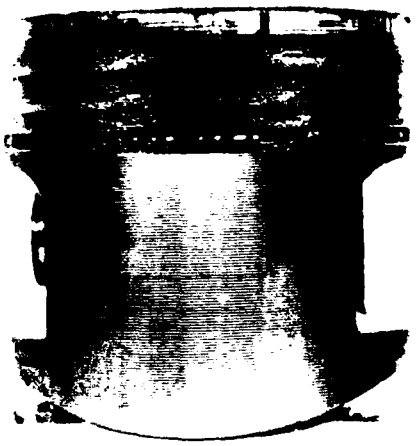
Myrtle Beach Vehicle 78B9188
Lubricant: Blue(D)

Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

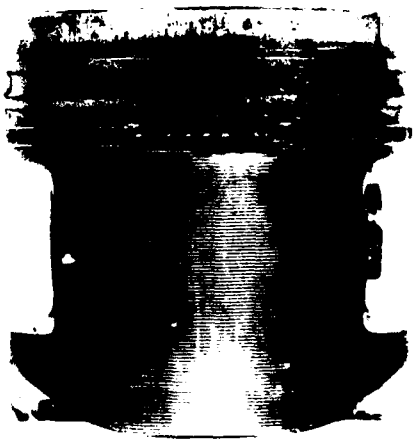
Offutt AFB Vehicle 78B4766
Lubricant: Green



Piston No. 2 Thrust Side

Anti-Thrust Side

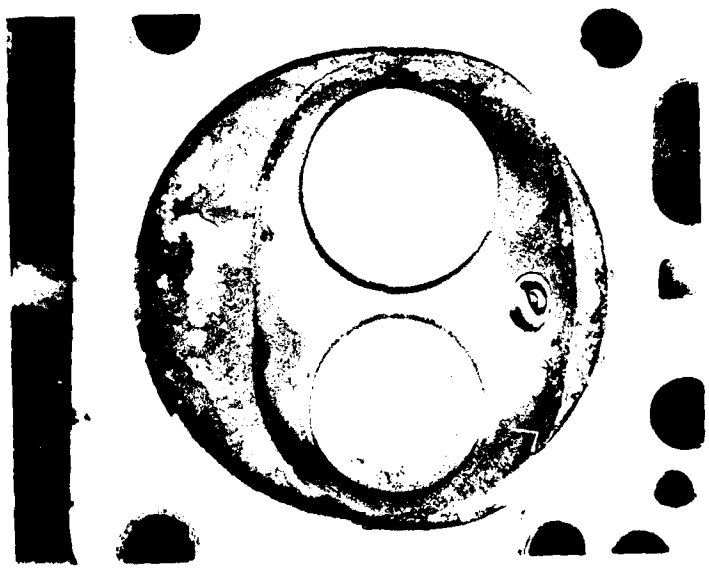
Piston No. 4 Thrust Side



Anti-Thrust Side

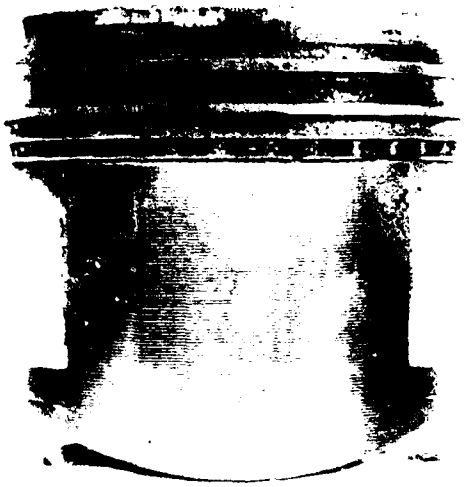
Offutt AFB Vehicle 7884766
Lubricant: Green

Intake Valves 1-6



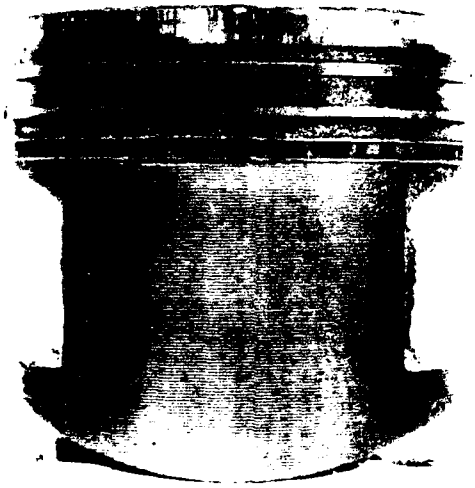
Cylinder Head Combustion Chamber No. 1

Offutt AFB Vehicle 78B4768
Lubricant: Blue(B)

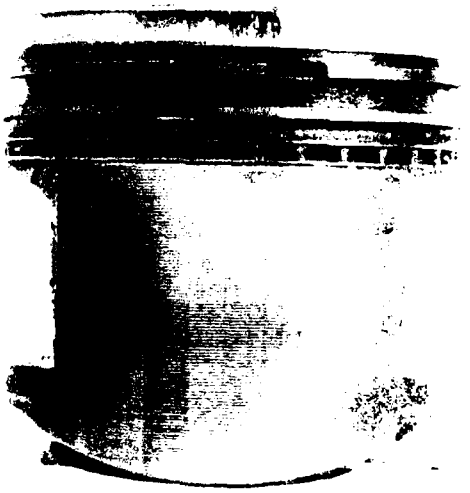


Piston No. 2 Thrust Side

Anti-Thrust Side

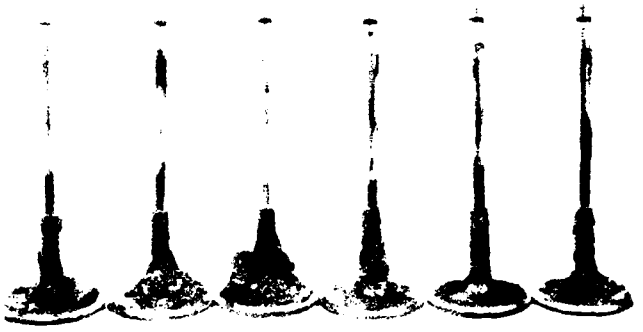


Piston No. 4 Thrust Side

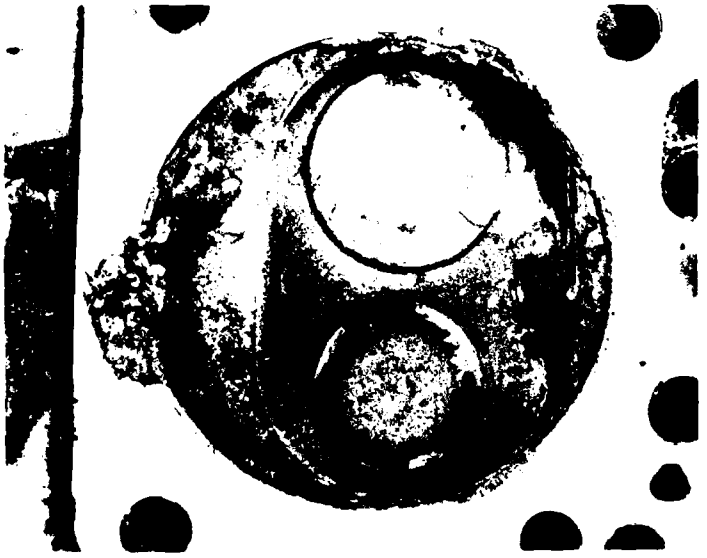


Anti-Thrust Side

Offutt AFB Vehicle 78B4768
Lubricant: Blue(B)

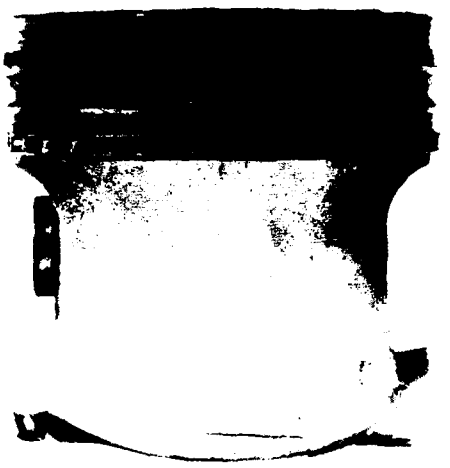


Intake Valves 1-6

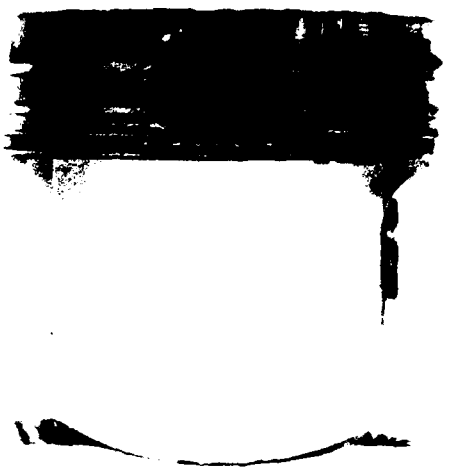


Cylinder Head Combustion Chamber No. 1

Peterson Field Vehicle 78B4569
Lubricant: Green



Piston No. 2 Thrust Side

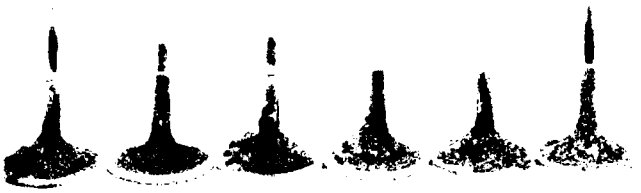


Anti-Thrust Side

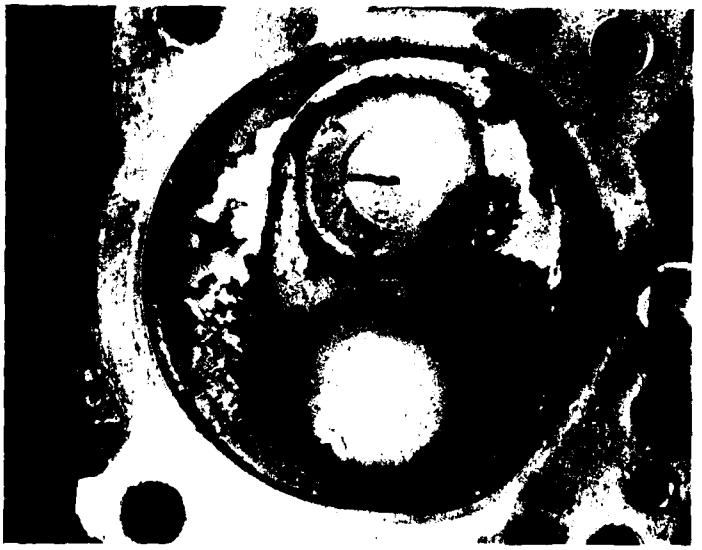
Piston No. 4 Thrust Side

Anti-Thrust Side

Peterson Field Vehicle 78B4569
Lubricant: Green



Intake Valves 1-6



Cylinder Head Combustion Chamber No. 1

Peterson Field Vehicle 78B4571
Lubricant: Yellow

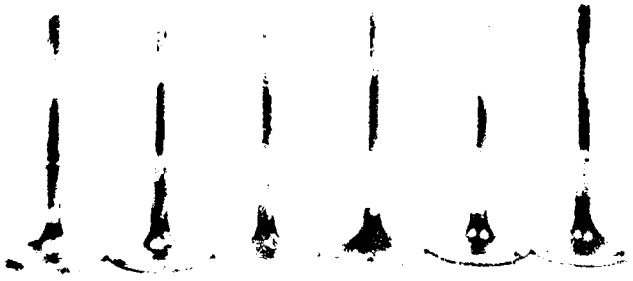
Piston No. 2 Thrust Side

Anti-Thrust Side

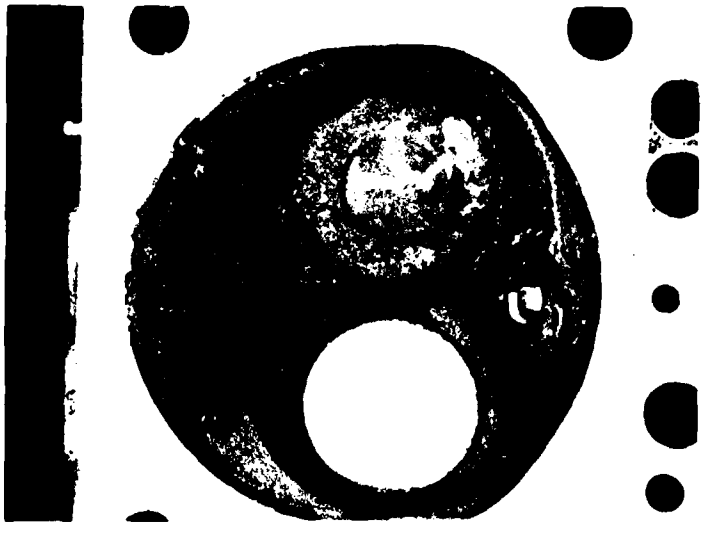
Piston No. 4 Thrust Side

Anti-Thrust Side

Peterson Field Vehicle 78B4571
Lubricant: Yellow

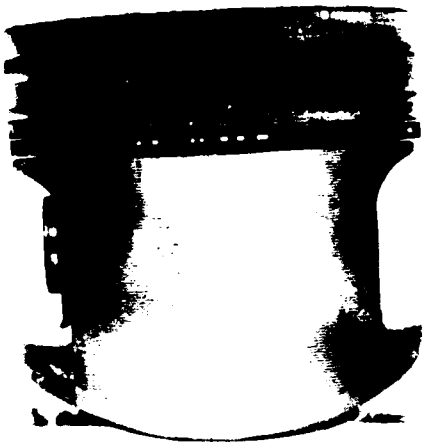


Intake Valves 1-6



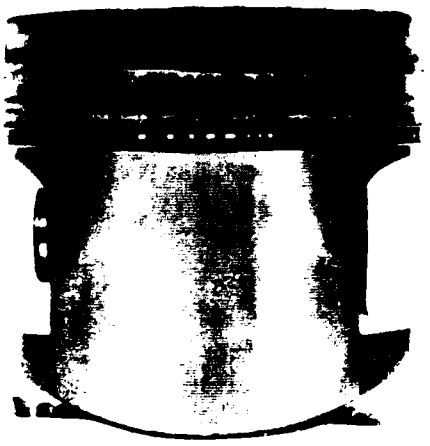
Cylinder Head Combustion Chamber No. 1

Peterson Field Vehicle 78B8831
Lubricant: Blue(C)



Piston No. 2 Thrust Side

Anti-Thrust Side

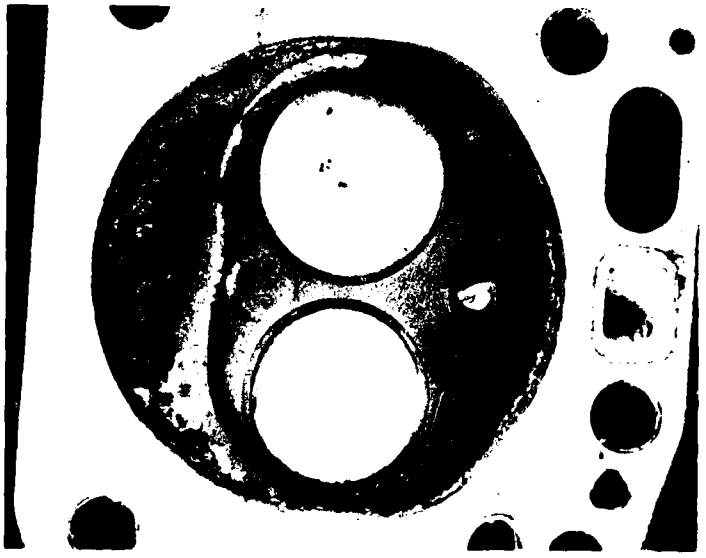


Piston No. 4 Thrust Side

Anti-Thrust Side

Peterson Field Vehicle 78B8831
Lubricant: Blue(C)

Intake Valves 1-6

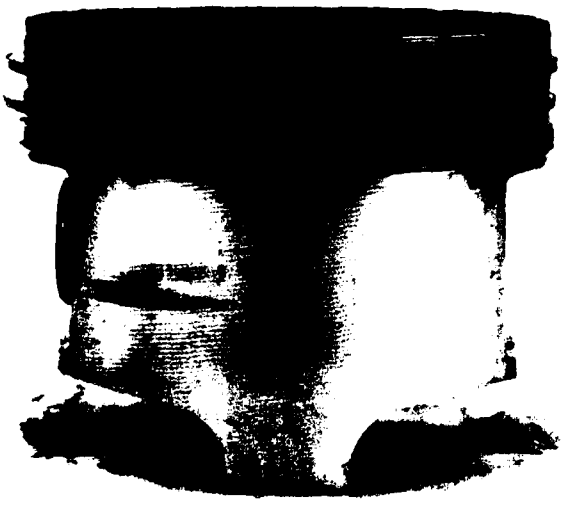


Cylinder Head Combustion Chamber No. 1

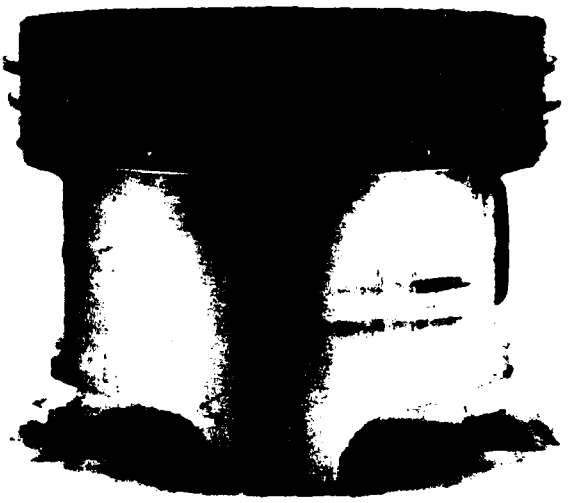
Randolph AFB Vehicle 79B5719
Lubricant: Yellow

Piston No. 1 Thrust Side

Anti-Thrust Side

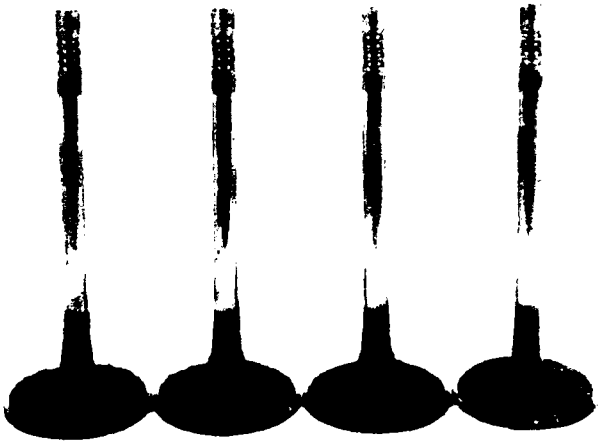


Piston No. 2 Thrust Side



Anti-Thrust Side

Randolph AFB Vehicle 79B5719
Lubricant: Yellow



Intake Valves 1-4

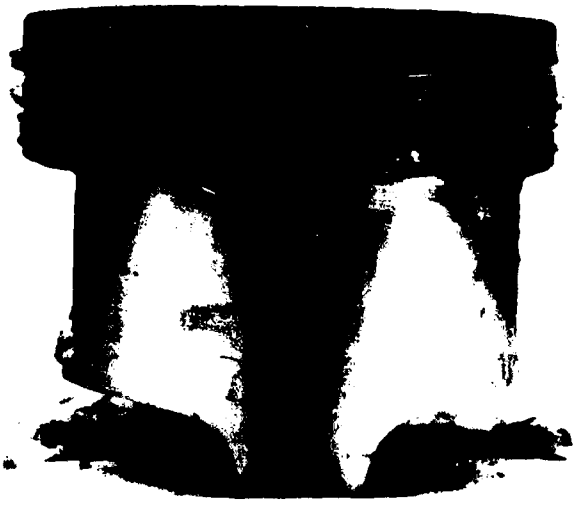
Cylinder Head Combustion Chamber No. 1

Randolph AFB Vehicle 79B5720
Lubricant: Blue(A)

Piston No. 1 Thrust Side

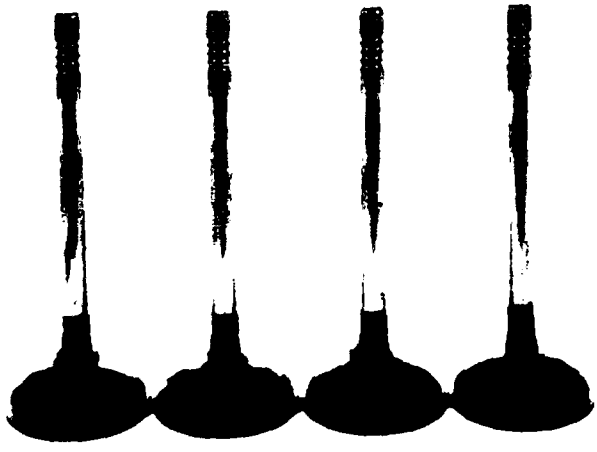
Anti-Thrust Side

Piston No. 2 Thrust Side

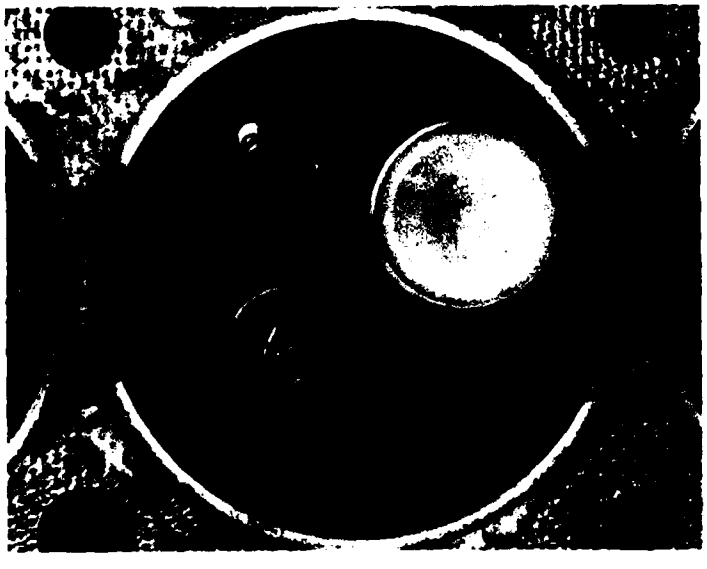


Anti-Thrust Side

Randolph AFB Vehicle 79B5720
Lubricant: Blue(A)

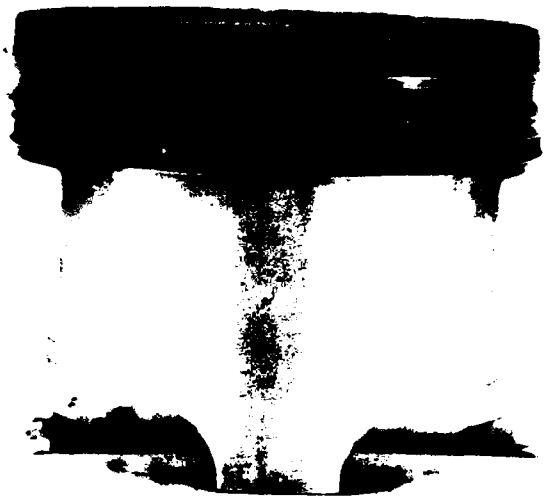


Intake Valves 1-4



Cylinder Head Combustion Chamber No. 3

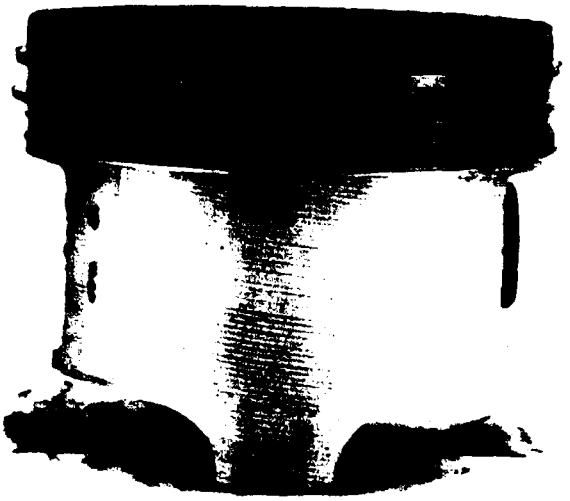
Randolph AFB Vehicle 79B5721
Lubricant: Green



Piston No. 1 Thrust Side

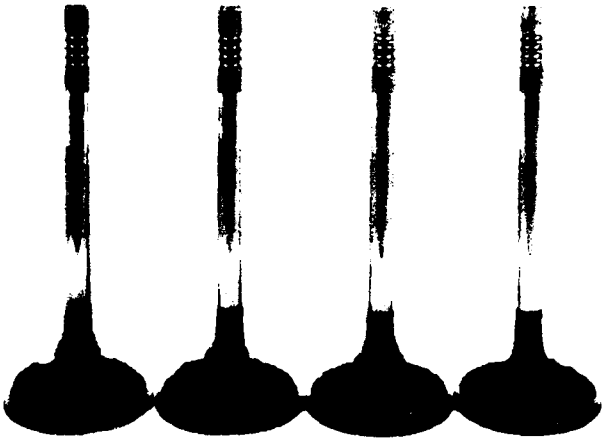
Anti-Thrust Side

Piston No. 2 Thrust Side

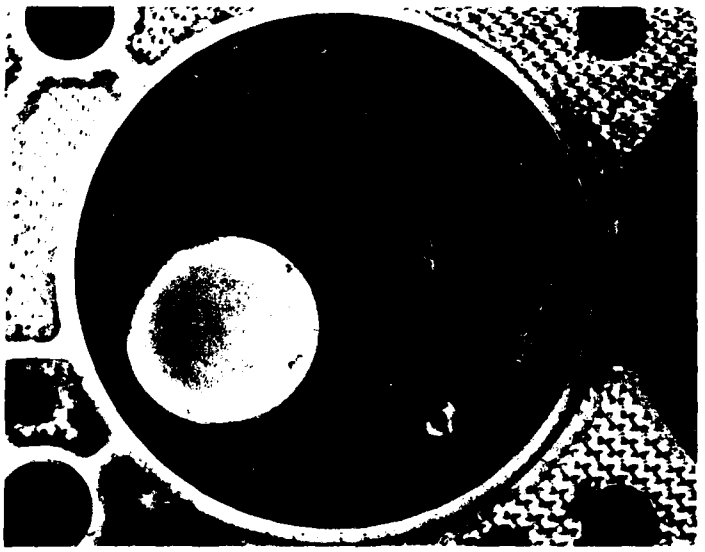


Anti-Thrust Side

Randolph AFB Vehicle 79B5721
Lubricant: Green



Intake Valves 1-4



Cylinder Head Combustion Chamber No. 1

APPENDIX D

LUBRICANT ANALYSES DATA-
MEANS AND STANDARD DEVIATIONS

APPENDIX D
LUBRICANT ANALYSES DATA - MEANS AND STANDARD DEVIATIONS

Wear Metals & Additives	YELLOW									
	78B4571	79B2534	79B5660	78B9187	79B5719	79B2270	78B5646	79B1734	$\bar{\bar{X}}$	$S_{\bar{\bar{X}}}$
Fe	561.86	47.0	203.30	118.68	81.25	572.80	113.10	86.94	223.12	217.16
Al	12.43	6.14	9.70	15.41	7.75	88.20	15.40	7.81	20.36	27.64
Cr	14.00	3.57	2.90	7.50	1.25	109.20	18.70	5.63	20.34	36.39
Cu	16.71	5.14	8.30	12.27	11.75	22.40	20.70	6.69	13.00	6.41
Mg	292.14	210.43	107.20	73.27	27.00	56.40	217.90	82.00	133.29	94.47
Na	44.00	39.00	39.70	35.95	41.25	32.00	130.40	488.13	106.30	157.63
Pb	998.00	31.86	58.70	72.18	64.00	998.00	768.10	109.13	387.50	448.24
Si	56.86	19.43	20.60	28.32	27.75	34.40	23.10	32.31	30.35	11.96
Sn	7.57	0.00	4.30	1.14	13.75	10.20	10.50	4.13	6.45	4.85
B	26.00	22.43	8.90	9.77	11.00	9.00	90.60	113.00	36.34	41.35
Ba	92.14	102.43	202.2	99.0	123.25	145.6	65.10	149.56	122.41	42.75
Ca	12.43	0.43	1.30	2.91	4.25	0.60	0.60	11.94	4.31	5.04
Mn	51.43	0.86	4.90	2.73	8.25	15.40	7.30	9.75	12.58	16.32
Mo	7.14	0.29	6.60	7.55	5.00	0.60	1.60	5.44	4.28	2.99
Zn	998.00	995.14	998.0	988.18	998.0	998.00	948.00	998.00	990.17	17.38
Ni	4.14	0.57	0.70	0.45	0.25	3.80	0.70	0.38	1.37	1.61
V	0.57	0.14	0.10	0.59	0.50	0.20	0.00	0.31	0.30	0.23
					OTHER DETERMINATIONS					
T(°F)	73.56	72.96	74.01	74.03	73.08	73.48	74.80	73.47	73.67	0.59
VDP*	119.14	154.14	113.80	108.22	134.00	101.60	102.00	175.60	126.06	26.72
Particulates**	0.32	0.08	0.14	0.25	0.04	0.13	0.23	0.02	0.15	0.11

* Viscosity Density Product (Centipoises x g/cm^3)
** Total solids in mL

APPENDIX D
LUBRICANT ANALYSES DATA - MEANS AND STANDARD DEVIATIONS
(CONT'D)

Wear Metals & Additives	BLUE										
	78B8831	78B4768	79B2539	79B5668	78B9188	79B5720	79B2272	79B1759	79B1735	$\bar{\bar{X}}$	$S_{\bar{\bar{X}}}$
Fe	517.50	619.54	189.17	71.90	58.24	149.17	365.38	72.06	41.25	231.58	216.79
Al	11.67	8.54	14.5	8.00	8.95	8.33	100.75	13.47	11.95	20.68	30.12
Cr	18.83	16.00	12.00	2.70	2.24	2.33	106.63	5.47	3.40	18.84	33.54
Cu	9.83	6.85	5.83	8.50	6.81	5.69	20.00	4.65	4.05	8.02	4.84
Mg	779.17	618.42	488.0	533.80	86.43	11.00	126.25	648.12	350.40	404.62	275.12
Na	38.17	19.77	23.00	22.80	25.52	25.00	19.13	20.24	132.30	36.21	36.48
Pb	998.0	998.00	35.00	37.40	70.14	35.50	998.00	63.18	60.90	366.24	473.99
Si	30.17	26.85	15.17	14.40	8.52	11.50	24.75	24.47	11.40	18.58	7.96
Sn	9.33	3.77	7.33	5.90	0.57	8.67	13.00	8.00	3.20	6.64	3.73
B	56.67	35.54	40.50	73.5	2.00	3.50	6.13	85.88	60.70	40.49	31.37
Ba	3.50	7.08	198.00	17.60	65.05	3.50	12.13	71.12	6.80	42.75	63.86
Ca	0.83	0.92	0.17	0.80	2.05	1.50	0.63	7.59	3.50	2.00	2.32
Mn	32.67	260.23	2.50	3.20	1.52	14.5	22.50	29.88	18.80	42.86	82.33
Mo	10.17	11.92	0.17	5.70	4.81	6.50	0.13	7.71	2.40	5.50	4.13
Zn	991.33	989.54	812.67	993.2	958.29	604.33	934.75	957.24	956.05	910.82	127.51
Ni	4.50	4.77	0.67	1.10	0.57	0.67	2.63	0.94	0.20	1.78	1.76
V	0.33	0.54	2.00	0.30	0.71	0.50	0.25	0.53	0.75	0.66	0.53
OTHER DETERMINATIONS											
T(°F)	73.77	74.28	73.12	74.51	73.99	74.4	73.93	73.24	73.70	73.88	0.48
VDP	112.67	124.92	154.04	95.93	98.85	121.83	111.57	130.28	161.14	123.47	22.44
Particulates	0.23	0.25	0.18	0.07	0.11	0.06	0.15	0.14	0.08	0.14	0.07

APPENDIX D
LUBRICANT ANALYSES DATA - MEANS AND STANDARD DEVIATIONS
(CONT'D)

Wear Metals & Additives	GREEN										
	78B4569	78B4766	79B2533	79B5659	79B5212	78B5038	79B5721	79B2271	79B1736	$\bar{\bar{X}}$	$S_{\bar{\bar{X}}}$
Fe	266.5	659.54	38.14	70.0	178.89	179.53	114.75	798.67	95.30	266.81	272.95
Al	11.00	14.38	10.57	10.62	14.33	27.60	14.0	224.33	13.30	37.79	70.14
Cr	13.83	18.23	6.29	3.23	6.56	8.40	2.25	192.67	3.20	28.30	61.87
Cu	6.50	8.08	3.57	3.54	10.00	17.80	9.0	30.0	3.75	10.25	8.66
Mg	721.17	761.38	653.29	656.92	601.47	595.80	646.75	761.33	674.25	674.71	61.56
Na	42.50	36.83	25.00	35.38	47.22	31.73	30.75	291.67	34.80	63.99	85.63
Pb	998.00	998.0	70.29	49.00	89.76	71.67	48.0	998.0	53.65	375.15	467.32
Si	19.33	28.08	9.86	10.92	12.33	21.13	13.50	54.33	15.8	20.59	13.90
Sn	7.50	5.54	3.86	4.85	4.83	4.60	16.0	49.00	8.65	11.64	14.49
B	4.00	6.38	2.86	5.38	2.39	1.67	2.0	166.67	3.10	21.60	54.42
Ba	998.0	998.0	902.14	998.0	966.94	998.0	998.0	998.0	998.0	983.90	32.33
Ca	0.50	2.92	0.14	0.31	3.06	3.07	2.00	4.67	6.95	2.62	2.23
Mn	34.0	255.38	1.00	2.85	2.56	5.27	15.25	24.33	12.10	39.19	81.83
Mo	6.67	12.69	0.00	7.00	11.39	0.20	9.00	3.33	8.05	6.48	2.55
Zn	942.17	969.54	880.00	842.0	873.78	802.6	901.0	998.0	826.95	892.89	66.18
Ni	1.83	5.08	0.29	0.69	1.33	0.53	0.50	8.33	0.40	2.11	2.77
V	0.33	0.77	0.86	0.31	0.61	0.93	0.50	1.33	0.70	0.70	0.32
OTHER DETERMINATIONS											
T(°F)	73.75	73.82	73.19	74.09	73.54	73.51	73.43	73.83	73.23	73.60	0.30
VDP	87.80	113.08	116.40	89.70	96.68	94.72	85.08	93.0	119.05	99.50	13.07
Particulates	0.13	0.18	0.11	0.15	0.15	0.18	0.11	0.22	0.14	0.15	0.04

APPENDIX E

STATISTICAL ANALYSIS

One of the primary goals of the Synlube test was to determine if the synthetic oils would perform better than the standard issue oil currently being used in the field. It was believed that one way of doing this was to determine, at a 99 percent confidence level, if there was any statistically significant difference between the means of average values for wear metals, additives, VDP and particulate content for each oil in the test. The Blue oils were evaluated collectively as one oil.

The first step in this analysis was to record the values for each variable as shown in the computer printouts from JOAP for each engine inspected. A mean (x) was then computed for each variable for each engine. These means are shown in Appendix D, Volume II. Next a mean and standard deviation of the mean was determined for each variable. These computations resulted in one mean ($\bar{\bar{x}}$) and one standard deviation ($S\bar{\bar{x}}$) for each variable for each test oil, also shown in Appendix D, Volume II. Certainly numerical differences were expected and occurred, quite large difference in some cases. To test these data, a statistical one-tailed test was used to verify or deny the hypothesis that there were no significant differences between the means (H_o=0)(one oil performed as well as another). Two procedures, an "F-test" and a "confidence interval procedure," were used before establishing a "range of predicted difference for the means" at a 99 percent confidence level. The formula for predicting the range of difference between the means was:

Range of difference between the means =

$$(\bar{\bar{x}}_H - \bar{\bar{x}}_L) \pm \left[\left(\frac{((n_H-1)S\bar{\bar{x}}_H 2 + (N_L-1)S\bar{\bar{x}}_L 2)}{(n_H + n_L-2)}\right)\left(\frac{1}{n_H} + \frac{1}{n_L}\right)\right]^{\frac{1}{2}} t$$

where:

$\bar{\bar{x}}_H$ = mean for variable with the higher standard deviation ($S\bar{\bar{x}}_H$)

$\bar{\bar{x}}_L$ = mean for variable with the lower standard deviation ($S\bar{\bar{x}}_L$)

$S\bar{\bar{x}}^2_{H_2}$ = variance for variable with the higher standard deviation

$s\bar{\bar{x}}^2_L$ = variance for variable with the lower standard deviation

n_H = number of elements in the sample with the higher standard deviation

n_L = number of elements in the sample with the lower standard deviation

t = a value used in determining a level of certainty in establishing a statistical range and determined by a degree of freedom $(n_H + n_L - 2)$ or calculated as shown later.

The F-test was used to determine if any adjustments to a confidence interval were needed. A calculated F-value was determined by the formula:

$$\text{F-value} = \frac{Sx_H^2}{S\bar{\bar{x}}_L^2}$$

The result was then compared to an F-value found in the F table for a 99 percent level of certainty for the degrees of freedom (n_H-1) for the numerator and (n_L-1) for the denominator. If the F-value from the table exceeded the calculated F-value, the F-test was considered "passed" (the null hypothesis was not rejected, nor were adjustments necessary for the confidence interval). If the F-value from the table did not exceed the calculated F-value, an adjustment was made for the confidence interval obtained from the "t" table (values determined for the degree of certainty wanted and a specified degree of freedom). The formula used for determining the corrected degree of freedom (d.f.) for entering the "t" table was:

Corrected d.f. =

$$\frac{1}{\left[\frac{K^2}{n_H - 1)} + \frac{(1 - K)^2}{(n_L - 1)}\right]}$$

where $K = \dfrac{\frac{S\bar{\bar{x}}_H^2}{n_H}}{\left(\frac{S\bar{\bar{x}}_H^2}{n_H} + \frac{S\bar{\bar{x}}_L^2}{n_L}\right)}$

If the value for the corrected d.f. fell between two integer values for degrees of freedom in the "t" table, an interpolated value was computed to establish the "t"-value for the corrected d.f.

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